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The
Canadian Society of Civil Engineers
176 Mansfield Street, Montreal

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REPORT
OF
ANNUAL MEETING
1915

Volume XXIX

MONTREAL:
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REMOTE STORAGE

The Canadian Society of Civil Engineers.

REPORT OF PROCEEDINGS OF TWENTY-NINTH ANNUAL
MEETING HELD AT THE SOCIETY'S HOUSE, 176 MANS-
FIELD STREET, MONTREAL, 26TH to 28TH JANUARY, 1915.

The President, Mr. M. J. Butler, C.M.G., in the Chair.

MORNING SESSION, 26TH JANUARY, 1915.

The Meeting was called to order at 10 a.m. The President read the following telegram from Lt.-Col. C. H. Mitchell, General Staff Officer, First Canadian Contingent:—

"To the Canadian Society of Civil Engineers, 176 Mansfield Street, Montreal. Greetings, President and members, annual meeting. Keep flag flying."

He also read a telegram from the Edmonton Branch of the Society as follows:—

"Edmonton Branch take this their first opportunity of extending greeting to the Society and express hope that we shall be able to do our share in extending its influence and look forward to time when provincial organizations will be established, and when they and Branches will occupy a place of still more importance in society affairs."

The Minutes of the Annual Meeting held January 27th to 30th, 1914, were read and approved. On the nomination of the President, the following gentlemen were elected as scrutineers for the ballot for the election of officers and members of Council for 1915:—Messrs. James Ewing (Chairman), J. A. Burnett, H. S. Deubelbeiss, V. A. G. Dey, E. G. E. Fiset.

For the ballot on the amendments to By-Laws:—Messrs. M. B. Atkinson (Chairman), W. N. Dietrich, A. J. Meyers, W. D. Lawrence.

The Secretary then made announcements as to the excursions in connection with the Meeting.

The Report of the Council, which had been distributed in advance of the meeting was, on the motion of Mr. Phelps Johnson, seconded by Mr. W. D. Lawrence, taken as read and received.

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REPORT OF COUNCIL FOR THE YEAR 1914

The Council presents the following report on the work of the Society during the past year:

ROLL OF THE SOCIETY.

The elections during the year were as follows:—Thirty-eight (38) Members, forty-six (46) Associate Members, one (1) Associate, sixty-three (63) Juniors, one hundred and sixty-nine (169) Students.

The transfers during the year were as follows:—Twenty-nine (29) Associate Members to the class of Member, twenty-one (21) Juniors to the class of Associate Member, one (1) Student to the class of Member, twenty-six (26) Students to the class of Associate Member, forty-eight (48) Students to the class of Junior.

Twenty deaths have been reported, and there have been removed from the rolls by resignation and on account of non-payment of dues, or on account of failure to apply for transfer to an appropriate grade: Five Members, nine Associate Members, four Associates, six Juniors and thirty-eight Students.

At present the membership stands as follows:—

Hon. Members	10
Members	674
Associate Members	1,372
Associates	36
Juniors	352
Students	615

Total 3,059

The membership of the Branches at the date of the last Annual Meeting was as follows:—

	Corporate.	Non-Corporate.	Total.
Quebec	59	40	99
Ottawa	159	48	207
Kingston	15	16	31
Toronto	119	58	177
Manitoba	117	40	157
Calgary	45	9	54
Vancouver	113	29	142
Victoria	49	14	63
	<hr/> 676	<hr/> 254	<hr/> 930

The resignations noted on the previous page have been due chiefly to the fact that the gentlemen in question have ceased to be actively engaged in engineering work, but also, unfortunately, in a few cases to inability to pay subscriptions as a result of lack of employment.

The twenty members who have been removed from the rolls of the Society by death are the following:—

Hon. Members..... His Excellency The Right Honourable
the Earl of Minto, G.C.M.G., LL.D.,
P.C.

The Right Honourable Lord Strathcona
and Mount Royal, G.C.M.G., LL.D.
(Hon. Cantab.)

Members..... William Crawford
Edmond R. Gabbett
John Galbraith, M.A., LL.D., (Past
President and Hon. Councillor)
Hamilton McM. Killaly
Alex. King Kirkpatrick
Alfred Noble
Walter Ambrose Pearson
Alexander Stewart
Edmond Bonner Temple
G. Herbert Webster

Associate Members... J. T. M. Burnside.
Alex. Campbell
Jeremiah Gallagher
A. H. Larochelle
Ernest E. Malvern
Roderick J. McD. Parke
Thomas H. Schwitzer

Associate The Hon. William Gibson

ANNUAL MEETING

The twenty-eighth Annual Meeting was held at 176 Mansfield Street, Montreal, in January, 1914, under the presidency of Mr. Phelps Johnson.

The first session was called to order on Tuesday, January 27th, at 10.30 a.m., and the meeting was adjourned on Thursday afternoon, January 29th.

MEETINGS

The Council has held sixteen meetings during the year. There have been six sectional meetings, nine monthly meetings, and four Junior Section meetings of the Society.

The following papers and addresses were presented:

Monthly Meetings:

"St. Lawrence River Bridge," by Mr. P. B. Motley, M.Can. Soc.C.E.

"Building Substructures, Built by the Pneumatic Method," by Mr. John W. Doty, M.Can.Soc.C.E.

"Pulp and Newspaper Manufacture," by Mr. J. Stadler.

"Subaqueous Tunneling," by Mr. P. A. N. Seurot, M.Can. Soc.C.E.

"Concrete Highway Construction," by Mr. L. S. Bruner, A.M. Can.Soc.C.E.

"Road Improvement in the Province of Quebec," by Mr. G. Henry, A.M.Can.Soc.C.E.

"Fire-Control in Relation to Military Rifle Fire," by Dr. A. C. Geddes.

"The System of Unit Construction in the Concrete Power-House at Cedars, Que.," by Mr. J. E. Conzelman.

"Mushroom Construction," by Mr. C. A. P. Turner, A.M.Can. Soc.C.E.

"An Integrating Weighing Machine for Materials in Motion," by Mr. H. E. T. Haultain, M.Can.Soc.C.E.

"The Wielder of the Weapon," by Mr. H. E. T. Haultain, M. Can.Soc.C.E.

"Methods of Treatment of Sewage Sludge," by Mr. P. Gillespie, A.M.Can.Soc.C.E.

Electrical Section:

"A Brief Summary on the Performance of Electrical Insulators," by Mr. J. C. Smith, M.Can.Soc.C.E.

"Making our Water Powers Valuable," by Mr. A. Surveyer, M. Can.Soc.C.E.

Mechanical Section :

"Steel Car Shops at Angus," by Mr. L. C. Ord.

"Steel Passenger Car Frame Construction," by Mr. C. Brady.

"Talk on Heavy Artillery," by Lieut. S. T. Layton, A.M.Can. Soc.C.E.

Mining Section :

"The Electrical Driving of Winding Engines and Rolling Mills," by Mr. C. A. Ablett, A.M.Inst.C.E., and Mr. H. M. Lyons, A.M.Inst.E.E.

"The Evolution of Stoping Methods in Mining during the Last Decade," by Mr. C. A. Macaulay, S.Can.Soc.C.E.

"Top Slicing System of Mining as Practised at the Mines of the Detroit Copper Company, Morenci, Arizona," by Mr. J. R. McLean, S.Can.Soc.C.E.

"Modern Artillery in the Field," by Lieut. S. L. Brunton.

Junior Section :

"Contracts and Costs of Brick Veneer Building Construction," by Mr. J. H. Norris, S.Can.Soc.C.E.

"Movable Bridges," by Mr. J. Robertson, S.Can.Soc.C.E.

"The Moose Jaw Water-Supply System," by Mr. R. M. Walker, Jr.Can.Soc.C.E.

"The Substructure of the Fraser River Bridge at Fort George," by Mr. H. L. Bodwell, A.M.Can.Soc.C.E.

BRANCH SOCIETIES

The several Branches of the Society, their Headquarters and Officers at this date are as follows:—

Vancouver —Headquarters, Metropolitan Building.

Chairman, G. R. G. Conway.

Sec.-Treas., J. R. Grant.

Manitoba —Headquarters, University of Manitoba, Winnipeg.
(Address Box 2918).

Chairman, E. E. Brydone-Jack.

Sec.-Treas., G. E. Bell.

- Toronto —Headquarters, Engineers' Club, King Street West.
Chairman, A. F. Stewart.
Sec.-Treas., J. S. Galbraith, 9 Rowanwood Ave.
- Ottawa —Headquarters, 110 Carling Avenue.
Chairman, G. A. Mountain.
Sec.-Treas., A. B. Lambe.
- Kingston —Headquarters, School of Mines.
Chairman, A. Macphail.
Sec.-Treas., L. W. Gill.
- Quebec —Headquarters, City Hall. (Address Box 115).
Chairman, A. Amos.
Sec.-Treas., J. des R. Tessier.
- Victoria —Headquarters, 534 Broughton Street. (Address P.O. Box 1290).
Chairman, F. C. Gamble.
Sec.-Treas., R. W. Macintyre.
- Calgary —Headquarters. (Address Box 2318).
Chairman, H. B. Muckleston.
Sec.-Treas., P. M. Sauder.
- Edmonton —Headquarters, University of Alberta. (Address Box 957).
Chairman, W. Muir Edwards.
Sec.-Treas., L. B. Elliot.

COMMITTEES.

The following have been the Committees of Council during the year:—

Library and House Committee:

H. M. MacKay, Chairman.	R. A. Ross.
F. P. Shearwood.	A. Stansfield.
A. Surveyer.	

Finance Committee :

C. N. Monsarrat, Chairman.	H. Holgate.
G. H. Duggan.	E. Marceau.
W. J. Francis.	

Gzowski Medal and Prizes for Students' Papers :

R. A. Ross, Chairman.	J. M. R. Fairbairn.
C. H. Rust.	R. J. Durley.
W. F. Tye.	J. B. Porter.
Phelps Johnson.	J. de G. Beaubien.
H. M. MacKay.	

OFFICERS OF SECTIONS

General :

W. J. Francis, Chairman.
E. Brown, Vice-Chairman.

Electrical :

R. M. Wilson, Chairman.
J. C. Smith, Vice-Chairman.

Mechanical :

H. H. Vaughan, Chairman.
R. A. Ross, Vice-Chairman.

Mining :

J. B. Porter, Chairman.
H. E. T. Haultain, Vice-Chairman.

Committee on Publications :

R. A. Ross, Chairman.	R. J. Durley.
H. M. MacKay.	J. B. Porter.
J. M. R. Fairbairn.	J. de G. Beaubien.

Committee on Meetings :

W. J. Francis, Chairman.

The Chairmen and Vice-Chairmen of Sections, the Chairmen of Branches and the following members:—

R. McColl.	R. O. Wynne-Roberts.
R. B. Rogers.	A. J. Latornell.
P. Gillespie.	F. X. A. Leofred.
J. C. Dufresne.	C. H. Mitchell.

The Board of Examiners for admission of candidates under by-laws 8 and 9 was as follows:—

H. M. MacKay, Chairman.	A. M. Gray.
A. Surveyer, Secretary.	P. E. Mercier.
R. S. Lea.	J. Flahault.
H. P. DePencier.	M. Beullac.

The following have been the Committees of the Society during the year:—

The Nominating Committee for Officers and Members of Council for the year 1915:

J. Duchastel de Montrouge, Chairman, representing District No. 1	
C. H. Rust, Past President of the Society.	
W. F. Tye, " " " " "	
Phelps Johnson, " " " " "	
J. S. O'Dwyer, representing District No. 2.	
R. A. Black, " " " 3.	
L. W. Gill, " " " 4.	
J. G. G. Kerry, " " " 5.	
J. S. Dennis, " " " 6.	
F. F. Busteed, " " " 7.	

Cement Specifications :

J. A. Jamieson, Chairman.	F. P. Gutelius.
C. H. Rust.	J. S. Dennis.
D. MacPherson.	H. Holgate.
C. E. W. Dodwell.	P. A. N. Seurot.
W. P. Anderson.	

Improved Engineering Service :

H. Holgate, Chairman.
A. W. Campbell.
J. A. Jamieson.
F. L. Wanklyn.

G. J. Desbarats.
A. St. Laurent.
L. A. Vallee.
H. J. Lamb.

Educational Requirements :

E. Marceau, Chairman.
R. W. Leonard.
W. F. Tye.

J. B. Porter.
H. Holgate.
H. Irwin.

Sewage Disposal :

R. S. Lea.
John Kennedy.
W. Chipman.
C. H. Rust.
W. Muir Edwards.
J. O. Meadows.

A. Surveyer.
A. F. Macallum.
A. J. McPherson.
P. Gillespie.
W. S. Lea.

Steel Bridge Specifications :

C. N. Monsarrat, Chairman.
F. P. Shearwood.
J. G. LeGrand.
R. F. Uniacke.
G. H. Duggan.

N. M. McLeod.
H. G. Kelley.
W. A. Bowden.
P. B. Motley.
F. C. McMath.

Conservation :

James White, Chairman.
C. R. Coutlee.
H. F. Laurence.
R. McColl.
R. O. Sweezey.
W. H. Breithaupt.
G. A. Bayne.
A. J. McPherson.
J. S. Dennis.
J. B. Hegan.
C. E. W. Dodwell.

A. E. Doucet.
R. S. Lea.
R. W. Leonard.
E. E. Brydone-Jack.
W. R. W. Parsons.
John Chalmers.
T. H. Tracy.
J. B. Challies.
C. H. Mitchell.
Wm. McNab.

The Electro-Technical Commission:

L. A. Herdt, Chairman.	L. A. Rosebrugh.
O. Higman.	J. Kynoch.
H. T. Barnes.	J. Murphy.
L. W. Gill.	A. B. Lambe.
W. A. Duff.	

Rails:

H. G. Kelley, Chairman.	J. M. R. Fairbairn.
G. A. Mountain.	A. F. Stewart.
M. J. Butler.	

Track, (Fastenings, Tie Plates and Ties):

H. R. Safford, Chairman.	R. L. Latham.
F. P. Gutelius.	A. Crumpton.
A. C. Mackenzie.	R. M. Hannaford.
E. W. Oliver.	Chas. Warnock.
D. MacPherson.	J. G. Sullivan.
S. B. Clement.	A. F. Stewart.
C. B. Brown.	W. A. Bowden.

Reinforced Concrete:

W. J. Francis, Chairman.	S. Baulne.
P. M. Morssen.	E. S. Mattice.
C. N. Monsarrat.	E. Brydone-Jack.
H. M. MacKay.	H. Rolph.
P. B. Motley.	P. Gillespie.
E. Brown.	

General Clauses for Specifications:

H. Holgate, Chairman.	W. Chipman.
E. G. M. Cape.	J. G. G. Kerry.
R. De L. French.	

Cast Iron Water Pipes and Specials:

F. H. Pitcher, Chairman.	C. H. Mitchell.
T. C. Irving, Jr.	F. X. A. Leofred.
N. J. Ker.	C. L. Fellowes.
A. Currie.	

The awards of the Gzowski Medal and of prizes for the best students' papers will, in accordance with the practice of previous years, be announced during the meeting.

The following is a statement of elections which have taken place since the issue of Bulletin No. 10:

August 18th, 1914.

Members :

Elgee, H. A.
Meurling, H. F. V.
Newman, R. L.

Associate Members :

Cook, W. A. M.	Murphy, C. J.
Dann, E. M.	Weeks, A. B.
Lembcke, R. E.	White, C. E.

Juniors :

Angell, H. G.	Laurence, Wm. S.
Cummiford, S. A.	Leishman, J. A.
Flitton, R. C.	O'Neill, H. J.
Junkin, R. L.	Ross, H. T.
Lamb, G. J.	Stanley, H. P.

Transferred from Associate Member to Member :

Brown, F. B.

Transferred from Junior to Associate Member :

Faus, H. W.
White, Robert.

Transferred from Student to Associate Member :

Macdonald, W. M.
Manson, A. B.
Nourse, A. E.

Transferred from Student to Junior :

DeValter, R. A.	Lacroix, P. A.
Ewart, D. M.	Lefebvre, H.

Students :

Brecht, J. F.
Ferguson, A. D.
Mathews, J. E.

September 21st, 1914.

Members :

Atwood, W. S.	Hillman, D.
Eddy, A. C.	Manchester, C. S.
Hayward, R. F.	

Associate Members :

Babcock, J. B.	Reoch, A. E.
Bergoust, O. J.	Rounthwaite, C. H. E.
Cook, F. L.	Smith, Wm. C.
Ellis, J. G. St. G.	Smither, Wm. J.
Goodwin, W. R.	

Associate :

McGuire, F. C.

Juniors :

Bonn, W. E. M.	Nicholson, J. B.
Fairn, A. S.	Saint-Laurent, J. B. O.
Fife, W. M.	Smith, D. R.
Keemle, R.	Stairs, G. S.
Menzies, A. F.	Warner, W. W.
Moxon, G. B.	

Transferred from Associate Member to Member :

Challies, J. B.	Ferguson, A.
Daw, Hilder.	MacLeod, G. R.

Transferred from Junior to Associate Member :

Rinfret, C.
Smith, K. H.
Street, J. C.

Transferred from Student to Associate Member :

Gordon, M. L.
Morrison, J. R.
Taunton, A. J. S.

Transferred from Student to Junior :

Ferguson, A. W.	Letson, J. E.
Ford, W. S.	Mauer, E.
Forest, A.	White, D. A.

November 17th, 1914.

Members :

Hanington, C. F.	Thorne, B. L.
Houston, G. N.	Yorston, W. D.
McLean, H. A.	

Associate Members :

McLachlan, J. B.	Montague, T. M.
Meek, V. M.	Talman, S. G.

Juniors :

DesRosiers, A.	McLeod, C. K.
Draper, W. H.	Powell, R. W.
Ferris, C. B.	Wade, M. L.
McLaren, A. A.	

Students :

Derrer, L. H.	McIntyre, J. R.
Dickson, W. S.	Mooney, F. M.
Flint, C. D.	Perry B. R.
Grant, W. R.	Richardson, A. A.
Lyons, E. L.	Weir, F. E.
Macdonald, C. A.	Williscroft, G. M.
Mahaffy, H. L.	Wilson, A. L.
McCully, R. C.	Wilson, J. C.

Transferred from Associate Member to Member :

Ford, A. L.
 Girdwood, E. P.
 Grant, J. R.

Transferred from Student to Associate Member :

Gilchrist, J. M.	MacDiarmid, A. A.
Hutchison, A.	Wood, J. R.

Transferred from Student to Junior :

Brown, E. C.	Lariviere, A.
Edwards, H. L.	Passy, P. de L. D.
Fisken, A. D.	Roy, A.
Hay, W. W.	Sullivan, A. W.
Inness, R. D.	Turner, G. R.
Jarman, P. E.	

December 15th, 1914.

Members :

Japp, H.
 Sands, E. E.

Associate Members :

Cahan, J. F. F.	Engholm, F. G.
Cowin, Jas.	Mathieson, D. M.
Dawes, A. S.	Theriault, L. L.

Juniors :

Allen, B.
 Legris, Jos.

Students :

Carnsew, C. N. T.	Lafoley, L. H.
Eadie, R. S.	Neilson, S. A.
Gibbs, C. R.	Richardson, S. S.
Gray, R. W.	Rochester, L. B.
Johnston, H. W.	Smith, H. F.

Transferred from Associate Member to Member :

Beullac, M. J.
Mackenzie, H. A.

Transferred from Junior to Associate Member :

Jamieson, E. A.
Kydd, Geo.

Transferred from Student to Associate Member :

Chene, J. D.
Randolph, T. G.

GENERAL

The routine work of the Council has been dealt with in the usual manner.

The following matters which have received attention during the year would seem to be especially worthy of note.

The instructions of the Annual Meeting in regard to the various Committees reporting to the Annual Meeting were carried out as promptly as possible. The Committees appointed by Council, together with those re-appointed at the last Annual Meeting, are given on Pages 5 to 10 of this Report. No action was taken by Council as to Testing Laboratories, the Committee in regard to which was discontinued by the Annual Meeting. Shortly after the list of Committees had been completed, a circular letter was addressed to them to the effect that their reports should be submitted to the Council before November 30th, in order that these might be printed and sent out to the membership; that failing this it would be impossible to give the subjects committed to them satisfactory consideration at the Annual Meeting.

Under the instructions of the Annual Meeting the resolution in regard to the co-ordination of surveys was duly transmitted to the Dominion Government and the receipt thereof acknowledged. The Council regrets that there does not seem to have been any advance made by the Government in this important matter.

Acting in conjunction with the Institution of Naval Architects, the Institution of Civil Engineers and other British and foreign associations, the Council took steps towards assisting in the establishment of a Memorial to the late Sir William White, Honorary Member of this Society. A circular letter in regard thereto was

sent to the members of the Society on June 12th, and as a result subscriptions towards the Memorial to the amount of \$230.65 were received and forwarded to the Secretary of the Memorial Committee in London.

In view of the resolution of the Annual Meeting regarding the subject of Datum Planes, to which the attention of the Society was called by the British Columbia Branches, the Council has, after some consideration, placed itself on record as of the opinion that the same plane of reference should, if at all practicable, be employed throughout the North American Continent. As this would involve consultation with the United States Coast and Geodetic Survey, the Secretary was instructed to seek the co-operation of Dr. W. F. King as the officer in charge of Geodetic Surveys of Canada.

There has been an interchange of views between the Council and the Vancouver and Victoria Branches as to the proposed Summer Convention of 1915, but no definite plans have been made on account of the unsettled conditions arising from the war. The suggestion of the Western Branches is that the month of June would be a suitable time for the Convention, and that such meetings as might be held should be in Victoria. On adjournment, Vancouver and engineering works in its neighborhood should be visited.

The Council desires once more to call the attention of members to the importance of contributing papers for the Transactions of the Society. In July last the Chairman of the Committee on Papers addressed a circular letter to corporate members and in connection therewith presented a list of subjects in the various departments of engineering which might serve as suggestions for the titles of communications. The Council has pleasure in recording the fact that a number of important papers have been contributed during the year, but would urge the membership to reflect that the present is an opportune time for them to make a record of the important works upon which many of them have been engaged. In this connection the Council is of opinion that a more complete co-operation by the Branches is desirable and practicable.

The fact that the papers presented to the Society and read at Montreal during the present session have been of the highest interest is attested by the circumstance that the audiences have been the largest in the history of the Society.

A complete list of the Branches is given elsewhere, and the Council has pleasure in recording the fact that a Branch has been established during the past summer in Edmonton under the Chairmanship of Professor W. Muir Edwards.

As a result of representations by the British Columbia Branches to the Government of the Province, the members of this Society have under the Provincial Water Act been specially recognized, and it is understood that efforts are being made to secure a similar recognition by the Government of Saskatchewan.

The Council has, during the year, named delegates to several Congresses, prominent among which were the International Conference on City Planning in Toronto, the Western Canadian Irrigation Association and the Good Roads Congress in Chicago.

A special meeting of Council was again held this year, in conformity with the practice established in 1913, at which an endeavor was made to secure the attendance of Councillors from all the Districts. At this meeting special attention was given to the amendments to By-Laws now being voted upon in regard to Provincial Divisions of the Society, to the Code of Ethics and to an amendment of the By-Laws governing the discipline or expulsion of members. There was a satisfactory attendance, although on account of the disturbed condition of the country the members residing at great distances did not find it practicable to be present at the meeting.

The members of the various grades of the Society who have, up to January 1st, enlisted for active service are as follows:—

Members	11
Associate Members	46
Juniors	29
Students	31
Total	<u>117</u>

In view of representations made, the corporate members of the Society have been invited to subscribe to a Special Fund from which the families of members of the Society who have gone to the war can be assisted in directions to which the resources of general funds may not be applicable. The Council has pleasure in reporting that this Fund now amounts to \$2,033.75, and is available for distribution under the direction of a special committee which has been appointed to advise in regard thereto.

Representations have been received from various sources to the effect that the Society should become active in the formation of an Engineering Corps for war services. The Council has signified to the Minister of Militia and Defence its desire to co-

operate in this connection, but the offers made have not as yet been accepted by the Government. A recent communication from the Toronto Branch to the effect that a Special Railway Corps should be organized directly under the British War Office is now under consideration with the idea that action will be taken in accordance with such competent advice as may be obtained from Great Britain.

By special resolution it has been decided to remit the dues of members of the Society actively engaged at the front during the term of their enlistment and a circular letter to this effect has been issued to the membership.

M. J. BUTLER, President.

C. H. McLEOD, Secretary.

January 9th, 1915.

REPORT OF THE LIBRARY AND HOUSE COMMITTEE.

The committee considered proposals for improving the acoustics of the lecture hall, but as the accomplishment of this would have involved considerable expenditure, it was decided to take no action for the present. Owing to the large attendance at most of the meetings during the year the acoustical defects were less noticeable than on some previous occasions.

Requests for exchange of publications were made by several Institutions, and exchanges were arranged in the case of the following:—

University of Western Australia,
University of Notre Dame, Indiana, U.S.A.
Department of Mines, Ottawa.

It was also agreed to exchange House Privileges with the Engineers' Club, Dayton, Ohio.

The Encyclopaedia Britannica, 11th Edition, was purchased and constitutes the most notable single addition to the library during the year.

Presentations to the Library were made by the following members:—

F. W. Cowie, M.Can.Soc.C.E.
H. E. Harcourt, Jr.Can.Soc.C.E.
J. B. Harvey, A.M.Can.Soc.C.E

S. E. Junkins, M.Can.Soc.C.E.
 F. C. Kunz, M.Can.Soc.C.E.
 G. A. Mountain, Past President Can.Soc.C.E.
 W. A. Plant, S.Can.Soc.C.E.
 W. F. Richardson, M.Can.Soc.C.E.
 R. M. Roy, M.Can.Soc.C.E.
 A. Surveyer, M.Can.Soc.C.E.
 Sir Wm. Van Horne, Assoc.Can.Soc.C.E.

The following additions were made to the Library:—

"Past, Present and Future of Railway Clubs." By D. M. Brady.
 "Twentieth Annual Report of the Massachusetts Highway Commission." 8vo. cloth, Boston, 1912.

Presented by THE MASSACHUSETTS HIGHWAY COMMISSION.

"Report of Transit Commissioners, City of Philadelphia." Vols. I. and II. Quarto Bds., Philadelphia, 1913.

Presented by A. MERRITT TAYLOR.

"Fallacy of Deep Sea Erosion Theory." By G. O. Case.

Presented by THE AUTHOR.

"Coast Sand Dunes, Sand Pits and Sand Wastes." By G. O. Case. Nar. 12mo. cloth, London, 1914.

Presented by THE AUTHOR.

"Coast Erosion and Foreshore Protection." By J. S. Owens and G. O. Case, 8vo. cloth, London, 1914.

Presented by G. O. CASE.

"Report on Blackwell's Island Bridge." By F. C. Kunz, M.Can Soc.C.E.

Presented by THE AUTHOR.

"City of New York, Department of Bridges Annual Report" for the Year ending December 31st, 1913. 8vo. cloth, 128 pp.

Presented by HON. F. J. H. KRACKE.

"Liquid Steel: Its Manufacture and Cost." By D. Carnegie and S. C. Gladwyn, 8vo. cloth, 505 pp., New York and London, 1913.

Presented by S. E. JUNKINS, M.Can.Soc.C.E.

"Report of Railway Commissioners of Canada," Ottawa, 1913 Cl. O.

Presented by G. A. MOUNTAIN, Past President, Can.Soc.C.E.

- "Proceedings of the Institution of Civil Engineers," Vols. 41, 43/47 and 52/58.
- "A Treatise on Astronomy." By Hugh Godfray, London, 1894.
- "The Engineering Works of the Kistna Delta." By G. T. Walch, Vol. I. Madras, 1899. Nar. Q. Cloth, 191 pp.
- "Report on Water Power for Transmission to Mexico City." By H. L. Cooper, New York, 1902. Q. Leather.
- "North America in South America, A Description of the Sao Paulo Electric Plant at Parnahyba," New York, 1902. Folio Leather.
- "Electrical and Magnetic Calculations." By A. A. Atkinson, New York, 1902. Nar. 12mo., 310 pp.
Presented by MRS. P. A. PETERSON.
- "The Effects of Errors in Surveying." By Henry Briggs, London, 1912. 12mo. Cloth, Duplicate.
- "Text Book of Theodolite, Surveying and Levelling." By James Park, London, 1911. 12mo. Cloth.
Presented by J. B. HARVEY, A.M.Can.Soc.C.E.
- "La Technique de la Houille Blanche." By E. Pacoret, 2 Vols. Paris, 1911. 8vo. Cloth, 2 Vols.
Presented by A. SURVEYER, M.Can.Soc.C.E.
- "Reinforced Concrete Construction." By G. A. Hool, 2 Vols., New York and London, 1912.
- "Hydraulic Turbines." By R. L. Daugherty, 2nd Edition, New York and London, 1914.
- "Transformer Practice." By W. E. Taylor, 2nd Edition, New York and London, 1913.
- "Excavating Machinery." By A. B. McDaniel, 340 pp. 8vo. Cloth, New York and London, 1913.
- "Design of Plate Girders." By L. E. Moore, 8vo., 283 pp. Cloth, New York and London, 1913.

"Efficiency as a Basis for Operation and Wages." By H. Emerson,
12mo. Cloth, 180 pp. 3rd Edition, New York, 1912.

"Suspension Bridges, Arch Ribs and Cantilevers." By W. H. Burr,
8vo. Cloth, 417 pp. 1st Edition, New York and London, 1913.

"A Text Book of Trade Waste Waters." By H. M. Wilson and H.
D. Calvert, 8vo. Cloth, 340 pp. London, 1913.
Presented by W. F. RICHARDSON, M.Can.Soc.C.E.

"Rainfall Reservoirs and Water Supply." By Sir Alex. Binnie, New
York and London, 1913.
Presented by H. E. HARCOURT, Jr.Can.Soc.C.E.

"Elements of Specification Writing." By R. S. Kirby, New York,
1913.
Presented by W. A. PLANT, S.Can.Soc.C.E.

"Report on Halifax Harbor." By F. W. Cowie, M.Can.Soc.C.E.
Ottawa, 1913.
Presented by THE AUTHOR.

"Report of Georgian Bay Ship Canal," 1908.

"Report of Transit Commissioner, City of Philadelphia." 1913, 2
Vols.

"Pennsylvania State Railroad Commission." Vol. 1911.
Presented by SIR WM. VAN HORNE, Assoc.Can.Soc.C.E.

Two Photographs of the Canadian Pacific Railway Bridge near
Trenton, Ont.
Presented by R. M. ROY, M.Can.Soc.C.E.

"Encyclopaedia Britannica." Eleventh Edition.
Purchased.

"American Hand Book for Electrical Engineers." By H. A. Pender,
New York and London, 1914.
Purchased.

"The Heat Treatment of Tool Steel." By H. Brearly, London and
New York, 1911.
Purchased.

The following is a complete list of periodicals, magazines, transactions, etc., regularly received and on file in the library.

Those marked † are paid for; all others are exchanges.

Those marked * are bound at the end of each year and placed on the shelves in the General Reading Room.

*American Society of Civil Engineers, Transactions and Proceedings, *New York*.

*American Society of Mechanical Engineers, Transactions, *New York*.

*American Society for Testing Materials, *Philadelphia*.

American Institute of Architects, Journal of, *Washington*.

*American Institute of Electrical Engineers, Transactions and Proceedings, *New York*.

*American Institute of Mining Engineers, Transactions, *Philadelphia*.

American Railway Engineering Association, *Chicago*.

American Water Works Association—Proceedings.

Anales de la Secretaria de Comunicaciones y Obras Publicas, *Mexico*.

"Antonio Alzate" Scientific Society, Transactions, *Mexico*.

Australian Inst. of Mining Engrs.

Association of Engineering Societies, Journal of, *New York*.

Association of Ontario Land Surveyors, Annual Report, *Toronto*.

Barge Canal, Bulletin, *New York*.

Bibliographie des Sciences et de l'Industrie, *Paris*.

Board of Water Supply of the City of New York, *New York*.

Boletin de Ingenieros, *Mexico*.

Boston Public Library, Bulletin and Annual Report, *Boston*.

Boston Society of Civil Engineers, *Boston*.

Brooklyn Engineers' Club, Proceedings, *Brooklyn*.

Builders' Bulletin, *Montreal*.

Bureau of Railway Economics, *Washington*.

Bureau of Standards, Bulletin, *Washington*.

Bureau of Mines, *Washington, D.C.*

Bureau of Mines, Report, *Canada*.

Bureau of Railway Economics, *Washington*.

*Canadian Engineer, *Toronto*.

Canadian Electrical News, *Toronto*.

- *Canadian Institute, Transactions, *Toronto*.
- Canadian Machinery and Manufacturing News, *Toronto*.
- †Canadian Magazine, *Toronto*.
- Canadian Manufacturer, *Toronto*.
- Canadian Mining Institute, Transactions, *Montreal*.
- Canadian Mining Journal, *Montreal* and *Toronto*.
- Canadian Municipal Journal, *Montreal*.
- Canadian Patent Office Record, *Ottawa*.
- Canadian Railway and Marine World, *Toronto*.
- Carnegie Library of Pittsburg, *Pittsburg*.
- "Central" Magazine of City and Guilds Central Technical College,
London, Eng.
- †Century, The, *New York*.
- †Chambers' Journal, *London, Eng.*
- Cincinnati Public Library, *Cincinnati*.
- Cleveland Engineering Society Journal and Transactions,
Cleveland.
- *Cleveland Institute of Engineers, Transactions, *Middlesborough*.
- Colorado School of Mines, Bulletin, *Golden, Cal.*
- Construction, *Toronto*.
- Contract Record, *Toronto*.
- Cornell Civil Engineer, *Ithaca, N.Y.*
- Crerar Library Reports, *Chicago*.
- Department of Colonization, Mines and Fisheries, *Quebec*.
- Department of Marine and Fisheries, *Ottawa*.
- Department of Mines, *Ottawa*.
- Department of Naval Service, *Canada*.
- Department of Public Works, *Ottawa*.
- Department of Railways and Canals, *Ottawa*.
- Department of the Interior, *Ottawa*.
- Electric Journal, *Pittsburg*.
- †Electric Railway Journal, *New York*.
- Electrical Review and Western Electrician, *Chicago*.
- Electrical Review, *London, Eng.*
- Electrical World, *New York*.
- Engineers' Club, *Baltimore*.
- *Engineers Club of Philadelphia, Proceedings, *Philadelphia*.

- *Engineers' Association of New South Wales, Transactions, *Sydney*.
- Engineers' Society of Western Pennsylvania, Proceedings, *Pittsburg*.
- Engineering & Contracting, *Chicago*.
- *Engineering News, *New York*.
- †Engineering and Mining Journal, *New York*.
- †*Engineer, *London, Eng.*
- *Engineering, *London, Eng.*
- Engineering Magazine, *New York*.
- *Engineering Record, *New York*.
- Engineering Review, *London, Eng.*
- Engineering Standards Committee Reports, *London, Eng.*
- Ferro Concrete, *London, Eng.*
- *Franklin Institute, Journal of, *Philadelphia*.
- Geological Survey of Western Australia, Miscellaneous Reports.
- Halifax City Engineer's Report, *Halifax*.
- Harbour Commissioners' Report, *Montreal*.
- †Harper's Monthly Magazine, *London and New York*.
- Heating and Ventilating Magazine, *New York*.
- †Illustrated London News, *London, Eng.*
- De Ingenieur, *Gravenhage*.
- Indian Engineering, *Calcutta*.
- Industrial Engineering and the Engineering Digest, *New York*.
- Institute of Mining and Metallurgy, *London, Eng.*
- *Institution of Civil Engineers, Transactions, *London, Eng.*
- Institution of Civil Engineers of Ireland, Transactions, *Dublin*.
- *Institution of Mechanical Engineers, Transactions, *London, Eng.*
- Institution of Naval Architects, *England*.
- *Institution of Engineers and Shipbuilders in Scotland, Transactions, *Glasgow*.
- *Institution of Electrical Engineers, Transactions, *London, Eng.*
- International Conciliation, *New York*.
- International Waterways Commission, *Ottawa*.
- Interstate Commerce Commission, *Washington, D.C.*
- †Iron Age, *New York*.
- *Iron and Steel Institute, Transactions, *London, Eng.*
- *Junior Engineering Society, Transactions, *London, Eng.*
- †La Lumiere Electrique, *Paris*.
- La Technique Moderne, *Paris, France*.
- *Liverpool Engineering Society, Transactions, *Liverpool*.

- †London Magazine, *London*.
- A Magyar Mernok-es Epitesz-Egylet, *Budapest*.
- Master Car Builders' Association, Proceedings, *Chicago*.
- †McClure's Magazine, *New York*.
- Mechanical Engineer, *Manchester*.
- Mining and Metal. Soc. of America.
- *Mining Institute of Scotland, Transactions, *Hamilton, Scot*.
- Mining Science, *Denver*.
- Mining Society of Nova Scotia, Journal, *Halifax*.
- Monthly Weather Review, *Washington*.
- Municipal Engineering, *Indianapolis*.
- New Orleans Sewerage and Water Board, Report, *New Orleans*.
- New York Department of Health, *New York*.
- North of England Institute of Mining and Mechanical Engineers,
Newcastle-on-Tyne, Eng.
- North East Coast Institution of Engineers and Shipbuilders,
Transactions, *Newcastle*.
- Nova Scotia Institute of Science, *Halifax*.
- Ontario Bureau of Mines, *Toronto*.
- †Outing, *London, Eng.*
- Page's Weekly, *London, Eng.*
- Patent Office Library, Reports of, *London, Eng.*
- *Philosophical Society of Glasgow, Transactions, *Glasgow*.
- Pocket List of Railroad Officials, *New York*.
- Providence, City of, Annual Report, *Providence*.
- Professional Memoirs, Corps of Engineers, U. S. Army.
- Public Health Journal, *Toronto*.
- †Punch, *London, Eng.*
- Practical Engineer and Engineer's Gazette, *London, Eng.*
- Railway Commissioners of Canada, Report of Board, *Ottawa*.
- Railway and Engineering Review, *Chicago*.
- Railway Engineering and Maintenance of Way Journal, *Chicago*.
- Railway and Locomotive Engineering, *New York*.
- Railway Age Gazette, *Chicago*.
- Railway Master Mechanic, *Chicago, Ill.*
- Revista Technologico Industrial, *Barcelona*.
- Royal Artillery, Journal of the, *Woolwich*.
- Royal Society of Canada, Transactions, *Ottawa*.
- Royal Engineers' Institute, Journal, *Chatham, Eng.*
- Royal Institute of British Architects, Transactions, *London, Eng*
- Royal United Service Institution, Journal, *London, Eng.*
- Royal Dublin Society, Proceedings, Scientific and Economic,
Dublin.

- Royal Society of Arts, Journal, *London, Eng.*
- *Royal Society of Edinburgh, Proceedings, *Edinburgh.*
- Royal Scottish Society of Arts, Journal, *Edinburgh.*
- School of Mines, Quarterly, Columbia College, *New York.*
- †Scribner's *New York.*
- †Sketch, *London, Eng.*
- Smithsonian Institution, Reports, *Washington.*
- Sociedad Cubana de Ingenieros, *Havana, Cuba.*
- Societe Scientifique Industrielle de Marseilles, *Marseilles.*
- Societe Industrielle de l'Est, *Nancy, France.*
- Societe Industrielle du Nord de la France, *Lille, France.*
- Societe des Ingenieurs Civils, *Paris.*
- *Society of Engineers, Transactions, *London, Eng.*
- Society of Naval Architects and Marine Engineers, Transactions, *New York.*
- *South Wales Institute of Engineers, Proceedings, *Cardiff, Wales.*
- Statistical Year Book of Canada, *Ottawa.*
- †Strand Magazine, *London, Eng.*
- The Steamship, *London.*
- Technical Index, *London, Eng.*
- Times Engineering Supplement, *London, Eng.*
- Tijdschrift van het Koninklijk Instituut van Ingenieurs, *Gravenhage.*
- Toronto, City Engineer's Report, *Toronto.*
- U. S. Army, Corps Engineers—Professional Mem., *Washington, D.C.*
- U. S. Army—Report, Chief Engineer, *Washington, D.C.*
- U. S. Artillery Journal, *Fort Monroe, Va.*
- U. S. Geological Survey Reports, *Washington, D.C.*
- U. S. Naval Institute, Proceedings, *Annapolis.*
- U. S. War Dept., Annual Report, *Washington.*
- Valve World.
- Western Australian Institution of Engineers, *Perth, Australia.*
- *Western Railway Club, Proceedings, *Chicago.*
- Western Society of Engineers, Journal, *Chicago.*
- †Windsor Magazine, *London, Eng.*

University Publications :

- Dalhousie University, Calendar, *Halifax.*
- McGill University, Calendar, *Montreal.*
- University of California, Chronicle, *Berkeley, Cal.*
- University of California, Publications, *Berkeley, Cal.*

University of Illinois, Bulletin, *Urbana, Ill.*

University of Manitoba, *Winnipeg, Man.*

University of North Dakota, Quarterly Journal, *North Dakota.*

University of Toronto, Trans. Engineering Soc., *Toronto.*

University of Wisconsin, Bulletin, *Madison, Wis.*

University of Missouri, Engineering Quarterly, *Columbia, Mo.*

Respectfully submitted,

H. M. MACKAY,

Chairman

January 9th, 1915.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

REPORT OF THE TREASURER.

The financial statements submitted to the Annual Meetings for several years past, have been highly satisfactory; but the same cannot be said of the year 1914.

While the statement for 1913 showed an excess of receipts over expenditure amounting to \$646.00, we closed the year just ended with a deficit of \$3,394.

This state of affairs is due to several causes, chief among which are: the cost of printing the Transactions, which, for the first part of 1914, were unusually voluminous; the increased amount of rebates to branches of the Society, and the maintenance of our new premises.

While the Society's affairs cannot be said to be in a bad way, it must be admitted that they are not flourishing, and, in this connection, it seems in order to call attention to the fact that arrears of members' fees are increasing in an alarming manner.

At the end of 1913, there was due the Society, under that head, no less than \$9,553.00. Of this amount, \$3,297.00 were collected during 1914, but the balance still unpaid is very much too large, and this is thought an opportune time to remind members generally, that annual dues are practically our only source of revenue, and to urge upon all the absolute necessity of regularly paying their dues, in order properly to maintain the Society.

ERNEST MARCEAU,

Treasurer.

Montreal, January 14th, 1915.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR ENDING 31ST DECEMBER, 1914.

Receipts

SUBSCRIPTIONS—

Arrears of Fees Collected..	\$ 3,297.58
Current Fees	15,615.69
Advance Fees	270.35
Entrance Fees	2,895.00
	<u>\$22,078.62</u>

INTEREST—

Savings Bank Account.....	\$ 12.53
Special Deposit Receipt ...	146.30
Overdue Fees	156.03
	<u>314.86</u>

Sales of Transactions and Periodicals

129.75

DIVIDENDS—

Can. Per. & West. Can. Mtg. Co. stock	\$ 22.50
Montreal Light, Heat & Power Co. stock	20.00
	<u>42.50</u>

Forward

\$22,565.73

Expenditure

INTEREST—

On Mortgage to 31st Dec., 1914	\$1,200.00
On Bank Overdraft	1.38
	<u>\$ 1,201.38</u>

Printing and Stationery, including

10,551.06

Books, Magazines and Library

259.45

Postage, Post Cards and Telegrams

1,837.25

Salaries of Secretary and Office

4,531.50

Caretaker's Wages

1,120.00

Taxes

1,253.80

Water Rates

104.00

Expenses—Annual Meeting

\$ 98.50

Expenses—Ordinary Meetings

462.04

Expenses—Board Meetings

54.70

615.24

432.16

186.85

29.45

507.47

169.35

116.45

6.30

Forward

\$23,011.71

CONTINUATION OF
STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR ENDING 31ST DECEMBER, 1914.

Report of Council

<i>Receipts</i>	<i>Expenditure</i>
Carried forward	Carried forward
\$22,565.73	\$23,011.71
	Sundries
	153.49
	Auditors
	150.00
	Bank Commission
	31.48
	Legal Expenses
	37.66
	Examinations—less Receipts
	222.00
	Students' Prizes
	50.00
	Gzowski Medal
	7.85
	REBATES OF FEES TO BRANCH SOCIETIES—
	Toronto
	\$429.25
	Quebec
	240.75
	Winnipeg
	396.00
	Ottawa
	567.75
	Vancouver
	297.00
	Kingston
	45.00
	Victoria
	178.75
	Calgary ...
	141.50
	2,296.00

TOTAL EXPENDITURE ON REVENUE
ACCOUNT
BALANCE—Being excess of Ex-
penditure over Receipts on
Revenue Account for year end-
ing 31st December, 1914.....

\$25,960.19

33

3,394.46

\$22,565.73

Verified, RIDDELL, STEAD, GRAHAM & HUTCHISON, C.A.,
Auditors.

Montreal, 13th January, 1915.

\$22,565.73

CANADIAN SOCIETY OF CIVIL ENGINEERS.
STATEMENT OF ASSETS AND LIABILITIES AS AT 31ST DECEMBER, 1914.

34

Report of Annual Meeting

<i>Assets.</i>		<i>Liabilities.</i>	
PROPERTY ACCOUNT—		PRIZE FUND ACCOUNT	\$ 468.77
Balance at 31st December,		ROYAL INSTITUTION FOR	
1913	\$88,873.46	THE ADVANCEMENT	
Expended during year	168.18	OF LEARNING—	
	<u>\$89,041.64</u>	Mortgage on Mans-	
FURNITURE—		field St. Property	\$20,000.00
Balance at 31st December,		at 6%	
1913	\$ 2,762.58	Interest accrued	200.00
Added during year	643.30	thereon to date...	<u>\$20,200.00</u>
	<u>\$3,405.88</u>	ACCOUNTS PAYABLE ..	4,941.93
LESS 10% written off for De-		SUNDRY REBATES DUE	
preciation	340.58	TO BRANCHES	1,087.75
	<u>3,065.30</u>		
BOOKS—Estimated value	6,150.00		
ARREARS OF FEES—Estimated			
value	5,000.00		
CANADA PERMANENT & WESTERN			
CANADA MORTGAGE CORPOR-			
ATION STOCK	180.00		
MONTREAL LIGHT, HEAT & POWER			
CO. STOCK	120.50		
GOLD MEDAL	45.00		
LOAN TO OTTAWA BRANCH	300.00		
CASH ON HAND	176.34		
BALANCE IN BANK OF MONTREAL.	3,385.91		
Forward	<u>\$107,464.69</u>	Forward	<u>\$26,608.45</u>

CONTINUATION OF
STATEMENT OF ASSETS AND LIABILITIES AS AT 31ST DECEMBER, 1914.

<i>Assets</i>		<i>Liabilities</i>	
Carried forward	\$107,464.69	Carried forward	\$26,698.45
SURPLUS—			
Balance at 31st De-			
cember, 1913 ...			\$84,351.28
Deduct Expenditure			
on Revenue Ac-			
count			\$25,960.19
Less Receipts on			
Revenue Account.		22,565.73	
		<u>3,394.46</u>	
			<u>\$80,956.82</u>
Estimated value of			
Books added to			
Library		150.00	
			<u>\$81,106.82</u>
LESS—Written off for			
Depreciation on Fur-			
niture 10%		340.58	
		<u>80,766.24</u>	

\$107,464.69

\$107,464.69

Montreal, 13th January, 1915.

Verified, RIDDELL, STEAD, GRAHAM & HUTCHISON, C.A.,
Auditors.

Obituaries

STRATHCONA, THE RIGHT HON. LORD, AND MOUNT ROYAL, G.C.M.G., LL.D., P.C., Hon. M.Can.Soc.C.E., was born 6th August, 1820, at Forres, Morayshire, Scotland. In 1838, as Donald Smith, he came to Canada as a cadet in the service of the Hudson Bay Co., and for 14 years, he was in charge of a trading post in the wilds of Labrador. From Labrador, he went to what was called at that time the North West Territories, where he became Chief Factor and later Resident Governor and Chief Commissioner over the entire Hudson Bay Territory.

As a public man and statesman, Lord Strathcona first came into prominence in connection with the insurrection known as the Red River Rebellion in 1869 when he was appointed special commissioner by the Government to enquire into the circumstances which led to the uprising of Louis Riel and his followers.

In 1871, he was elected to the Manitoba Legislature for the City of Winnipeg, and for twenty years thereafter was a prominent figure in the politics of Canada.

Lord Strathcona's name is indissolubly associated with Railway development in Canada, and with the building of the Canadian Pacific Railway in particular. In acknowledgment of his services and labors in connection with this railway, he was knighted by the late Queen Victoria in 1886.

In 1896, he retired from Canadian political life and was appointed to represent the Dominion in London as High Commissioner, a post which he held until the time of his death. At the time of this appointment he became a member of the Imperial Privy Council, and in 1897 was created Baron Strathcona and Mount Royal.

Many University honors were conferred upon Lord Strathcona because of his interest in the cause of education. In addition to his other activities, he was chancellor to two Universities, and was a patron of numerous colleges and educational institutions.

As a patron of art, he was well known. Together with Lord Mount Stephen, he endowed a Canadian scholarship in the Royal College of Music, London, and later endowed one on his own account. His collection of pictures has been called "the most catholic and abundant in Canada."

During the South African War, he raised and maintained throughout the time of their service, a mounted regiment from Western Canada, known as the "Strathcona Horse," a corps whose name became a synonym for daring, bravery and valor.

Lord Strathcona was the author of two important works "Western Canada Before and Since Confederation" and "The History of the Hudson Bay Company."

As a most princely benefactor, he will probably be longest remembered. To the newer generation in Canada, his great exploits in the fields of politics and finance mean only brilliant incidents in the history of the Dominion, but to the man on the street to-day the name of Strathcona probably immediately conjures up an impression of a man who gave away millions. His private and unostentatious charities for the relief of the oppressed were without number, and of only a few of his public benefactions has any record been kept. On the occasion of the Queen's Jubilee in 1887, he, with Lord Mount Stephen, gave a million dollars for the building and endowment of the Royal Victoria Hospital at Montreal, which sum was supplemented with a further donation of \$800,000 for maintenance. To McGill University alone, he has given over two million dollars. In 1896 he erected and endowed the Royal Victoria College in affiliation with McGill for the higher education of women.

Of his more recent benefactions, he gave nearly half a million to promote the introduction of military training in the Canadian Public Schools; one million to the King Edward Hospital Fund; and large donations to other hospitals and Y.M.C.A. buildings, etc., all over Canada. His ever ready cheque has meant much to hundreds of clergymen all over the Dominion.

As High Commissioner for Canada, Lord Strathcona has left a shining example of public spirit and personal self-sacrifice.

His death occurred in England on the 21st of January, 1914.

MINTO, HIS EXCELLENCY THE RIGHT HON. THE EARL OF; G.C.M.G., LL.D., P.C., Hon. M.Can.Soc.C.E., was born in 1847. He was educated at Eton and Cambridge, and had a brilliant career as a soldier. In 1871, he was in Paris during the Communist uprising. He followed the Carlist Army in Spain as a war correspondent. He witnessed the operations of the Turkish Army on the Danube, and was present during the bombardment of Nokolopolis and the historic crossing of the Danube. He was with General Roberts in the Afghan campaign, and later served as his secretary in South Africa. He fought the Egyptians as a Captain of mounted infantry in 1882, and was severely wounded at Magfar. Later,

he became military secretary to Lord Lansdowne, the Governor-General of Canada, and during this service helped to put down the North-West Rebellion as chief of staff under General Middleton. On his return to his native land, he served as Brigadier-General of voluntary infantry in Scotland.

In 1898, Lord Minto was appointed Governor-General of Canada, which position he held until 1904. Many events of great interest affecting Canada and the Canadian people took place during his term of office, the most important of which was the outbreak of the South African War.

In 1907, Lord Minto was appointed Viceroy of India, which is the most important and lucrative post in the British Colonial Governments. He closed his long public career in 1909, when he resigned from the Viceroyalty.

He died in London on 1st March, 1914.

DUFFY, AMBROSE, M.Can.Soc.C.E., was born at Newton Stewart, Scotland, 8th January, 1844. He studied for seven years under Willet & Co., Civil Engineers, Aberdeen, Scotland. Mr. Duffy came to Canada in 1867, and was first employed under the City Surveyor of the city of Montreal. In 1872, he was on the staff of the North Shore Railway as Assistant Engineer. From 1873 to 1881, he had charge of all the survey works of the late H. M. Perrault, Architect and Surveyor for the City of Montreal. He later went to Ottawa and was engaged as Division Engineer from Casselman to Ottawa on the Canada Atlantic Railway. During 1883-8, Mr. Duffy held important engineering positions on the Gatineau Valley Railway, the Pontiac and Pacific Railway, and on Government surveys under Mr. Collingwood Schreiber. In 1888 he became Assistant City Engineer at Ottawa, which position he held until 1892. From that time until his death which occurred on 26th July, 1914, he was Chief City Assessor of Ottawa.

Mr. Duffy became a member of the Canadian Society of Civil Engineers within a month of its inception.

GABBETT, EDMOND RICH, M.Can.Soc.C.E., was born in Limerick, Ireland, 28th February, 1851. He was educated in Ireland and later was a pupil with R. Stephenson and Co., Newcastle-on-Tyne, England. In 1876, Mr. Gabbett was appointed superintendent and manager of the erection of various chemical works in England, Belgium, France, Spain and Canada for Messrs. Burt, Boulter and Haywood, of London, England. He was a member of the Institute of Civil Engineers of London.

He died in January, 1914.

GALBRAITH, JOHN, M.Can.Soc.C.E., was born in Montreal, 5th December, 1846. After receiving his primary education at Port Hope Grammar School, Dr. Galbraith entered Toronto University and graduated as a B.A. in 1868. He was awarded the gold medal in mathematics and the Prince of Wales prize. He took his M.A. degree in 1876. It was through Dr. Galbraith's persistent efforts that the Legislative Assembly sanctioned the establishment of the well-known School of Practical Science. Upon the establishment of the school, he assumed the full responsibility of instruction in engineering, and for twenty-five years was instrumental in training men who have since proved a strong factor in the development of Canada. In recognition of his work as an educationalist and engineer, both Toronto and Queen's Universities conferred upon him the honorary degree of LL.D. In the year 1906, the School of Practical Science became the Faculty of Applied Science and Engineering of the University of Toronto, of which Dr. Galbraith was appointed Dean.

Outside of his college work, Dr. Galbraith had a notable career as an engineer. He was engaged on the construction of the Intercolonial Railway and of the Midland Railway extension to Sudbury. His extensive knowledge of the geographical and geological nature of the country was acquired by canoe and trail, years before other white men had penetrated into the Indian's domain. In 1907, he was appointed a member of the Commission to investigate and report upon the collapse of the Quebec Bridge.

In 1909, he was elected President of the Canadian Society of Civil Engineers having been associated with it since its inception.

Dr. Galbraith will be perhaps best remembered as a teacher. He possessed to a remarkable degree the faculty of imparting knowledge to others, and was beloved and revered by all his students.

He died at Go Home on 22nd July, 1914.

GARDEN, JAMES F., M.Can.Soc.C.E., was born at Woodstock, N.B., 19th February, 1847. His first engineering experience was on the Northern Railway of Canada extension. He was afterwards engaged on the location of the Credit Valley Railway. For eight years Mr. Garden was employed by the Dominion Government as a D.L.S. outlining townships. He moved to Vancouver in 1888 and engaged in private practice as a D.L.S. He was chief engineer of the first Vancouver Street Railway.

Mr. Garden took a great interest in politics, and represented the City of Vancouver in the Provincial Legislature for many years.

He was senior partner in the firm of Garden, Taylor, Roberts and Hawkins at the time of his death, which occurred in Vancouver on 9th December, 1914.

KILLALY, HAMILTON McMURRAY, M.Can.Soc.C.E., was born at St. Joseph, Mo., 25th July, 1871. He received his early education at Trinity College School, Port Hope, Ont., and later at McGill University from which he graduated in 1896. Mr. Killaly was from the date of his graduation until 1899 with the C.P.R. in many responsible positions.

During the Boer war, he enlisted with the Second Canadian Mounted Rifles, and served through the campaign with his regiment.

Returning to Canada in 1902, he again joined the engineering staff of the C.P.R. and was engaged on reconnaissance from Yahk to Spokane. In 1903 he made a reconnaissance for the Sudbury-Kleinburg Branch, and immediately followed this with a preliminary survey and location of the same line from Romford to Bolton. Early in 1905 he returned to Montreal to complete his plans and data and was then appointed assistant engineer at Toronto. During this same year, Mr. Killaly made a reconnaissance for the Georgian Bay and Seaboard Railway, located a line from Bathurst to Tiffin, and followed this by the location of the Georgian Bay and Seaboard Railway as Assistant Engineer in charge of parties in the field. On completion of these surveys in 1906, he was transferred to the Montreal office as Assistant to the Division Engineer of Construction and in the year 1911 was appointed Engineer of Surveys for Eastern Lines, which position he resigned in 1913 to join the Government Railways as Engineer of Construction.

Although Mr. Killaly had not quite reached the age of forty-three when his life's work was ended, his had been a life of important achievements, and many fine stretches of railway in Canada are the result of his unerring accuracy of reconnaissance, and his genius for locating his line whether on prairie or mountain. His ability to withstand privation on survey trips was proverbial among engineers. Shortly after his government appointment, his health broke down, no doubt superinduced by the hardships he suffered in the Boer war.

He died in Montreal on the 18th of March, 1914.

KIRKPATRICK, ALEXANDER KING, M.Can.Soc.C.E., was born at Kingston, 14th April, 1861. He graduated from the Kingston Royal Military College in 1882. Mr. Kirkpatrick spent many years on railway work, principally with the Canadian Pacific Railway in various responsible capacities. His work with this company covered

points from the Atlantic to the Pacific Coast. For some years past Mr. Kirkpatrick had been Professor of Civil Engineering at Queen's University, Kingston.

He died in May, 1914.

NOBLE, ALFRED, M.Can.Soc.C.E., born at Livonia, Mich., U.S.A., 7th August, 1844. From 1862 to 1865, he served in the Civil War. He was educated at the University of Michigan, from which he graduated in 1870, with degree of C.E. He later received the degree of LL.D. from this University, and also from the University of Wisconsin.

Mr. Noble was Assistant Engineer on river and harbor works on the Great Lakes for two years, and filled positions of trust on bridge and railway work from 1870 to 1894. In 1895, he was appointed a member of the Nicaragua Canal Board by President Cleveland. In 1899, President McKinley appointed Mr. Noble a member of the Isthmian Canal Commission, which was charged with the selection of the best canal route across the American Isthmus, and it has been substantially on the route selected by this commission that the Panama Canal has been constructed. In 1905 President Roosevelt appointed him a member of the International Board of Engineers to recommend whether the Panama Canal should be constructed as a sea level or a lock canal. In 1907, Mr. Noble was one of the three appointed to visit the Panama Canal to investigate the conditions regarding the foundations of some of the principal structures. In addition to the work connected with the appointments mentioned, Mr. Noble was engaged in practice as a Consulting Engineer under the firm name of Noble & Woodard. He was for a time Consulting Engineer to the Quebec Bridge Board, also Consulting Engineer for the Board of Water Supply, New York City, and for many other Public Service Commissions.

Mr. Noble has been President of the American Society of Civil Engineers, of the Western Society of Engineers, and of the American Institute of Consulting Engineers. He was elected an Hon. Member of the Institute of Civil Engineers of London, Eng.

He received several medals in recognition of his notable achievements as a Civil Engineer.

He died in New York, 19th April, 1914.

PEARSON, WALTER AMBROSE, M.Can.Soc.C.E., was born at Putnam, Conn., 3rd July, 1869. He graduated from Tufts College, Mass., as A.B. in 1890. After graduation he was employed by the West End Railway Co., of Boston, Mass., for three years. In 1893

he went to Brooklyn to take charge of the electrification of the Brooklyn Heights Ry. In 1895 he was engaged on the electrical installation and construction of power stations and substations, and the electrification of lines and equipment of cars for the Metropolitan Street Ry. Co., of New York. This position he occupied until 1905. Mr. Pearson came to Niagara Falls in 1905 as Mechanical and Electrical Engineer for the Electrical Development Co. of Ontario. In 1906, he was appointed Chief Engineer of this company, and also of the Toronto and Niagara Power Co. He was also Consulting Engineer for various companies and corporations. He was a member of the Institute of Civil Engineers, the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, and various other scientific bodies.

He died in New York on 25th January, 1914.

STEWART, ALEXANDER, M.Can.Soc.C.E., was born 23rd April, 1854. Mr. Stewart had been for twenty years identified with the Great Northern Railway at Seattle, Wash., and at the time of his death held the position of Assistant Chief Engineer of that railway. Extensive improvements in the west were carried on under his direction, including the tunnel under the City of Seattle, concrete snowsheds in the Cascades, and terminal improvements at many points.

Prior to his service with the Great Northern, Mr. Stewart was Chief Engineer of the Duluth and Winnipeg Railway. He located the Portage la Prairie line for the Provincial Government of Manitoba, and he also located the Prince Edward Island Railway for the Dominion Government.

He died in Seattle on 6th June, 1914.

TEMPLE, EDMUND BONNOR, M.Can.Soc.C.E., was born 1st December, 1837. After receiving his education and degree as a Civil Engineer in Quebec, Mr. Temple was engaged on preliminary survey of the Sorel and Drummondville Railway. He was later connected with the North Shore Railway, and the Newfoundland Railway. From 1881-3 Mr. Temple was Resident Engineer, Toronto, Grey & Bruce Railway, and from 1883 to 1888 was Assistant Engineer on Ontario division of C.P.R. Shortly after this date, he was appointed a Government Engineer, his work consisting chiefly of harbor development and general construction work at Toronto Island. For nine years he has held the office of harbor master at Port Arthur, but retired from active work about a year before his death, which occurred on March 17th, 1914.

WEBSTER, GEORGE HERBERT, M.Can.Soc.C.E., was born at Creemore, Ont., 31st January, 1857. For the greater part of his engineering life, Mr. Webster was connected with Railway work. From 1879 to 1882, he was Assistant Engineer Northern, Hamilton and Northwestern Railways. He held the office of Assistant Engineer of the Manitoba and Northwestern Railway, and later was appointed Engineer-in-charge of the same road. From 1900 to 1905, he occupied various positions of trust on the Canadian Pacific Railway, the last of which was as Division Engineer in Vancouver. In 1905 he retired from railway work to become President and Engineer of the British Columbia General Contract Co., of Vancouver. Some five years ago, he resigned this position and carried on a private practice as an Engineer and Contractor.

He died at Vancouver, 27th December, 1914.

BURNSIDE, JOHN THRIFT MELDRUM, A.M.Can.Soc.C.E., born at Toronto, 29th June, 1874. Mr. Burnside was a Post Graduate in Applied Science, University of Toronto. For two years following his post graduate work he held the position of Fellow on the staff of the Department of Applied Science, University of Toronto. He then obtained an Imperial Commission, and was sent to the Gold Coast, West Africa, where he spent three years, part of which time he acted as Commandant. Returning to Canada in 1905, he took a position on the construction of the James Bay Railway, (now C.N.O. Ry.), near French River. He was transferred from this point in May, 1906, to St. Casimir, P.Q., when the Canadian Northern commenced the construction of the Garneau-Quebec line. He was resident engineer in charge of the construction of the line at that point. Later in the same year he occupied the position of engineer for the contractor on the Guelph, Goderich division of the C.P. Ry. at Goderich. In 1907 he accepted a position as engineer in charge of construction on the Canton-Hankow Railway in China, in which capacity he had charge of some very creditable work. He remained in China until June, 1909, returning to Canada after a short visit in the Straits Settlement and in India. Shortly after his return he became interested in mining work in Cobalt, Gowganda and Kirkland Lake districts. He disposed of his holdings and spent some months in Europe. After his return he went to the Southern States for his health, and finally moved to Asheville, where his death occurred on 2nd December, 1914.

Mr. Burnside was widely known as an expert on Rugby football, and it was through his efforts that the old style of massed play was discarded and the Burnside Rules adopted with some modifications.

Associated with Colonel W. R. Lang, Mr. Burnside was largely responsible for the creation of the Canadian Field Engineers, and until he left for the Gold Coast, he held a commission in that corps. He was widely and popularly known in many places, having travelled extensively both before and after entering professional work.

CAMPBELL, ALEXANDER, A.M.Can.Soc.C.E., was born 14th September, 1875. He graduated from the Faculty of Applied Science, McGill University, in 1897, and spent the following eight years as a Patent Examiner in the Department of Agriculture. He later became General Superintendent of the International Marine Signal Co. After ten years' service with this company, he was appointed Vice-President and General Manager of the Campbell Steel & Iron Works, Limited, Ottawa.

When volunteers were called for the first Canadian Contingent, he organized a company of Field Engineers for active service, and while in training at Valcartier contracted an illness which resulted in his death on 19th October, 1914.

GALLAGHER, JEREMIAH, A.M.Can.Soc.C.E., was born in Ireland, 4th April, 1839. He came to Canada in 1860, and was for a number of years a Professor of English and Mathematics at St. Anne's College, Quebec. At a later date, he entered the employ of the Quebec Corporation as City Waterworks Engineer, which position he had held for forty years.

His death occurred at Montreal on 20th July, 1914.

MALVERN, ERNEST EDWIN, A.M.Can.Soc.C.E., was born 23rd December, 1874. He was educated at Bristol University. While in England Mr. Malvern was employed as Assistant Engineer in the Bridge Department of the Great Western Railway Co. He came to the United States some years ago, where he was engaged on survey work. In 1908, he came to Canada and joined the engineering staff of the Dominion Bridge Co., Montreal. He was later engaged both in Canada and in the United States on the design and erection of many large reinforced concrete buildings. In 1911 Mr. Malvern returned to Montreal and was employed by Messrs. Metcalf & Co., and the Canada Cement Co., on the design of steel and concrete structures.

He died in Montreal on 24th February, 1914.

PARKE, R. J. MCD., A.M.Can.Soc.C.E., born 6th April, 1874. At the time of his death, Mr. Parke was Managing Director of the

Automatic Electric Cook Co., Limited, of Toronto. He was the designer of the first long distance transmission plant in Canada, which was from the Ragged Rapids, on the Severn River, to Orillia. Mr. Parke reported on the cost of distributing electricity throughout Toronto, and this report was used in part when the design now in operation was being prepared. He was in charge for the Dominion Government of the design and construction of the lighting and power system for the Welland Canal. He was formerly head of the firm of Parke and Leith, an agency for the British Aluminium Co., Limited, and as a result of his labors in this industry, he founded the Canada Wire & Cable Co.

He died on 25th August, 1914.

SCHWITZER, THOMAS H., A.M.Can.Soc.C.E., was born 28th August, 1878. He graduated from McGill University as B.Sc. in 1901. His first position of importance was as engineer-in-charge of the erection of a steel dipper dredge, tow boat, etc., for the Egyptian Government. Mr. Schwitzer was for three years Assistant Superintendent Montreal Harbor Works. He was later engaged as Factory Engineer by the Northern Electric Company which position he held for two years. For nearly two years he had charge of the design of central heating plants for the United States Navy Department. Mr. Schwitzer was at the time of his death in charge of all machinery, motors, etc., of the Government Printing Bureau, Ottawa.

He died in Montreal on 15th March, 1914.

GIBSON, WILLIAM, A.Can.Soc.C.E., was born at Peterhead, Scotland, 7th August, 1849. For many years Mr. Gibson took an active part in railway and bridge building in Canada. He had charge of the construction of masonry work on the Grand Trunk Railway System in Canada. He built the approaches and portals of the Sarnia Tunnel and had charge of the doubling of the Victoria Jubilee Bridge at Montreal.

Mr. Gibson was a prominent figure in Canadian politics. He had been a senator for many years before his death which occurred on 4th May, 1914.

BURNHAM, GEORGE HUBER, S.Can.Soc.C.E., born at Toronto, 15th November, 1888. Mr. Burnham was educated at the Royal Military College, Kingston. While working on the Manitoba Hydrographic Survey, he was accidentally drowned in July, 1912.

DISCUSSION ON REPORT OF COUNCIL.

Mr. W. McNab in discussion of the report made certain suggestions as to verbal changes. On motion by Mr. Phelps Johnson, seconded by Mr. W. D. Lawrence, the Report of Council was adopted. The Report of the Library and House Committee was taken as read and received. Mr. H. M. MacKay moved, seconded by Mr. A. J. Meyers, that the Report be adopted. This motion was carried. The Auditor's report and the Treasurer's statement were received, and on motion by Mr. W. J. Francis, seconded by Mr. E. W. Oliver, were received.

Mr. H. Holgate referred to the large amount of arrears of subscriptions, and moved the following: "The Annual Meeting desires the Council to put forth every effort to reduce the outstanding fees to a minimum and requests that the branches be urged to co-operate to this end." The motion was seconded by Mr. W. J. Francis, who remarked that the matter was one which had received a great deal of consideration by the Council. The situation was a serious one, and the Council, he was sure, would be glad to have the instructions of the Meeting in the premises. After a discussion the resolution was unanimously adopted.

The Financial Report on motion by Mr. H. Holgate, seconded by Mr. Phelps Johnson, was adopted unanimously.

The President stated that the reception of the Reports of the Branches of the Society would be the next matter of business. The following Report of the Vancouver Branch, was read by the Secretary:—

REPORT OF THE VANCOUVER BRANCH.

On behalf of the Vancouver Branch we take pleasure in submitting the following report for the year 1914:—

The present membership of the Branch is One Hundred and Fifty-one, distributed as follows:—

Members	48
Associate Members	74
Juniors	15
Students	10
Associates of the Branch	4

One member four Associate members, and two Juniors are with the First Canadian Expeditionary Force, Overseas. One member and one student are with the Second Canadian Contingent, and one Associate member is with the Royal Engineers.

We much regret having to record the death during the past month, of James F. Garden and G. H. Webster, Members, Can.Soc. C.E.

Fourteen meetings were held during the year and the following papers, most of them illustrated with lantern slides, were presented.

- Jan. 6. "Panama Canal," by E. A. Cleveland, M.Can.Soc.C.E.
- " 20. "Sewer Construction," by A. G. Dalzell, A.M.Can.Soc.C.E.
- Feb. 3. "The Canadian Northern Pacific Railway Construction," by J. V. Nimmo, M.Can.Soc.C.E.
- " 17. Discussion; Proposed Dam at the Second Narrows, Burrard Inlet, opened by J. H. Kilmer, A.M.Can.Soc.C.E.
- Mar. 3. "Movable Bridges," by J. R. Grant, M.Can.Soc.C.E.
- " 17. "Town Planning," by J. W. B. Blackman, M.Can.Soc.C.E.
- Apr. 21. Annual Meeting and Conversazione.
- May 15. Election of Officers.
"Harbors of the World," by C. E. Fowler, M.Can.Soc.C.E.
- Sept. 2. Meeting for formation of a Field Company of Engineers for Home Defence.
- Oct. 29. Chairman's Address; "Influence of Engineers in Modern Warfare," by G. R. G. Conway, M.Can.Soc.C.E.
"Doukhobor Suspension Bridge over the Kootenay River," by J. R. Grant, M.Can.Soc.C.E.
- Nov. 19. "Jordan River Power Development, Vancouver Island Power Co.," by C. A. Lee, A.M.Can.Soc.C.E.
- Dec. 3. "Fuel Oil and its Application," by J. J. Ferris.
- " 11-12. Annual Convention and Dinner of the Victoria and Vancouver Branches in Victoria, B.C.
- " 17. "The Substructure of the Pitt River Bridge," by E. G. Matheson, M.Can.Soc.C.E.

At the meeting of May 15th, the following officers were elected to hold office for the season 1914-15:—

Chairman—G. R. G. Conway, M.Can.Soc.C.E.

Vice-Chairman—H. E. C. Carry, M.Can.Soc.C.E.

Executive—Donald Cameron, M.Can.Soc.C.E., A. D. Creer, M.Can.Soc.C.E., W. A. Clement, M.Can.Soc.C.E., N. J. Ker, M.Can.Soc.C.E.

Secretary-Treasurer—J. R. Grant, M.Can.Soc.C.E.

Auditors—H. P. Archibald, A.M.Can.Soc.C.E., B. R. Warden, M.Can.Soc.C.E.

On October 20th, R. F. Hayward, M.Can.Soc.C.E., was appointed to fill the vacancy caused by the retirement of W. A. Clement.

The library and reading room of the Branch has been moved to the Metropolitan Building, new furniture has been purchased, new books added, and the principal Engineering Magazines kept on file.

G. R. G. CONWAY, Chairman,

J. R. GRANT, Secretary-Treasurer.

On motion by Mr. H. E. T. Haultain, seconded by Mr. E. W. Oliver, this report was adopted.

The following Report of the Toronto Branch was read by Mr. E. W. Oliver:—

REPORT OF THE TORONTO BRANCH.

Attendance and interest have been maintained during the year in a way that is exceedingly gratifying to the Executive of the Toronto Branch of the Canadian Society of Civil Engineers. The year's programme of meetings comprises the following:—

Wednesday, February 11th, 1914.—Luncheon at McConkey's. Speaker, Mr. C. R. Young. Subject, "A Technical Library." Number present, 77.

Wednesday, February 25th, 1914.—Illustrated Lecture in the Chemistry and Mining Building at the University. Speaker, Mr. C. N. Monsarrat. Subject, "The Quebec Bridge." Number present, 235.

Thursday, March 5th, 1914.—Discussion on the Progress Report of the Committee on Reinforced Concrete of the Canadian Society Civil Engineers. Number present, 50.

Thursday, March 12th, 1914.—Luncheon at the Woodbine Hotel. Speaker, Mr. Geo. Powell. Subject, "Municipal Engineering." Number present, 104.

Thursday, March 26th, 1914.—Illustrated Lecture in the Chemistry and Mining Building at the University. Speaker, Mr. J. G. G. Kerry. Subject, "The Proposed Railway Terminal of the T. & N. O. Railway System on James Bay." Number present, 125.

Thursday, April 16th, 1914.—Luncheon at the Military Institute. Speaker, Mr. J. R. W. Ambrose. Subject, "The Engineer and his Work." Number present, 73.

Thursday, April 23rd, 1914.—Illustrated Lecture at the Engineers' Club. Speaker, Mr. J. Keele. Subject, "The Clays and Clay Industries of Canada." Number present, 40.

Wednesday, October 28th, 1914.—Illustrated lecture at the Engineers' Club. Speaker, Mr. J. Roy Cockburn. Subject, "Naval Architecture." Number present, 70.

Saturday, October 31, 1914. The Annual Outing of the Branch. This took the form of an excursion to St. Catharines and the Welland Ship Canal. Number present, 138.

Thursday, November 26, 1914. Smoker and Lecture at the Engineers' Club. Speaker, Mr. A. F. Stewart. Subject, "The Bridges destroyed during the South African War." Number present, 80.

Thursday, December 10, 1914. Illustrated lecture in the Chemistry and Mining Building at the University. Speaker, Mr. C. N. Cauchon, Ottawa. Subject, "Town Planning Problems of the Federal Capital with special reference to its Railway Features." Number present, 50.

Monday, January 18, 1915. Address in the Physics Building of the University. Speaker, Mr. M. J. Butler, President of the Can.Soc.C.E. Subject, "The Relation between the Engineer and the Contractor." Number present, 350. The annual dinner of the Branch was held in the evening of the same day, the guests of the occasion being Mr. Butler, President, and Professor McLeod, Secretary, of the parent Society.

The average attendance at the meetings during the year has been 116.

A gross increase in membership of 80, equal to 37%, has taken place during 1914, as is shown by the following schedule:—

	1914.	1913.
Members	45	42
Associate Members	106	102
Associates	8	8
Juniors	33	28
Students	103	35
	<hr/> 295	<hr/> 215

The retiring executive believe that a new Constitution and new By-laws will regulate procedure and the conduct of business in the meetings of the Branch, and desire to suggest this to their successors in office.

An active Library Committee has been at work during the year with the result that the books of the four libraries, viz.: The Toronto Branch Canadian Society Civil Engineers, the Engineers' Club, the Ontario Society of Architects, and the Ontario Association of Land Surveyors, have been recatalogued, substantial additions thereto have been made and the collection in other ways rendered

available to a larger body of readers than were able previously to make use of it.

The question of permanent quarters for the use of the Toronto Branch is up to the present unsolved. Owing mainly to the financial situation, the plans having in view the acquisition by the Engineers' Club of a commodious building on University Avenue, have been temporarily discontinued. Had these not been interrupted, it was the intention to have housed the Toronto Branch in the proposed new home of the Engineers' Club in accordance with an agreement that would no doubt have worked out satisfactorily to all concerned. In the meantime, the old arrangement with the Engineers' Club continues, whereby for a nominal rental, certain rooms in their quarters remain at the service of the Branch.

Through an arrangement concluded by the Secretary of the Branch with the managers of various works and plants, the visiting of a large number of places of engineering interest by the members of the Branch has been facilitated. By this arrangement, identification passes were issued to applicants and these, when presented by the holders, were duly honored by the works managers and superintending engineers. This feature has been much appreciated by the members, and especially by the students.

In the death of Dr. John Galbraith, which occurred on the 22nd of July last, the Society suffers an irreparable loss. Dr. Galbraith was one of the charter members of the Society, and served as Councillor for many years, and as President in 1908. For thirty-six years Dean Galbraith directed the instruction in the School of Practical Science, and in its successor, the Faculty of Applied Science and Engineering of the University of Toronto. As an educator his ability was widely recognized, and as an engineer he enjoyed the universal confidence of the members of his profession. His contributions to the science of Bridge Engineering contained in the report of the Royal Commission, which investigated the collapse of the Quebec Bridge, will continue to be a "witness to his intellect, his learning, his industry and his courage." While his excellent judgment, his sanity and his thoroughness rendered his opinions valuable on a great variety of subjects, his personality, his diversified interests and his extended human sympathies made him the most companionable of men.

We regret also to report the deaths of Mr. J. T. M. Burnside, A.M.Can.Soc.C.E., and Mr. Roderick J. McD. Parke, A.M.Can.Soc. C.E., both members of the Toronto Branch.

The following gentlemen have been elected to the various committees for the year 1915:—

Chairman—J. R. W. Ambrose.

Council—J. G. G. Kerry, W. A. Bucke, Geo. A. McCarthy, A. F. Stewart, (*ex officio*.)

Secretary—C. H. Fuller.

Library Committee—A. L. Mudge, W. A. Hare, J. R. Cockburn, H. J. Bowman.

Representative for District No. 5 on the Nominating Committee—E. W. Oliver.

A. F. STEWART, Chairman.

Mr. H. E. T. Haultain moved the adoption of the Report, and remarked that a very large amount of work had been done during the year, work which, in his opinion, would benefit the whole Society. Mr. A. F. Stewart, who had been Chairman of the Branch during the year, and Mr. J. S. Galbraith the Secretary-Treasurer, were deserving of special credit for their energetic work. Mr. Haultain referred in feeling terms to the loss the Society had sustained in the death of Dr. Galbraith. The Report was unanimously adopted.

APPENDIX TO THE REPORT OF THE TORONTO BRANCH.

LIBRARY COMMITTEE'S REPORT.

During the year extensive additions have been made to the Library. These consist of 213 Volumes of the Transactions of various Engineering Societies, 7 Volumes of the Engineering Index, 90 Volumes of Engineering Text Books, 17 bound volumes of periodicals, approximately 450 copies of Government, Provincial, Municipal and State reports, and publications of University Experiment Stations, etc., and a set of Standard topographical maps of Canada.

The additions to the library were sufficiently classified by October last to warrant the issue of a library bulletin, which was sent to all members of the Society. The bulletin is incorporated as part of this report.

The Engineers' Club have provided space for the housing of the additional books by means of new book cases containing approximately 60 lineal feet of shelving which has been entirely filled up.

Arrangements are now being made for issuing a printed catalogue of the books in the four libraries mentioned. Copies of this catalogue will be sent to members when ready.

Sixty-three books have been borrowed since October 23rd, mainly by students of the S.P.S., and a few by the older members. Considerable use has been made of the library for consultation purposes, however, no record has been kept of the extent of such use where books are not borrowed. The Committee appreciate very much the various gifts which have been made to the library. Some of these are of considerable value, and a special plea is made to members for further contributions of suitable books, proceedings and reports. The Committee did not depend entirely on their own judgment in the selection of books, but obtained suggestions from many of the members before purchases were made.

As will be seen from the financial statement, a large proportion of the past year's expenditure was made on the Proceedings and Transactions of the various Engineering Societies, British, American and Canadian. The cost of keeping these up to date in future will be comparatively small, so that a larger proportion of the funds will be available for Engineering text books.

SUMMARY OF EXPENDITURES OF LIBRARY COMMITTEE, 1914.

Proceedings, Transactions and Reports	\$328.04
Books	130.16
The Engineering Index	14.10
Freight, express, postage, cartage and customs brokerage on books, transactions, etc.	16.15
Pamphlet cases	11.03
Binding	48.60
Typewriting, stationery, postage, etc.	26.65
Printing, Bulletin	7.75
Rubber stamp and pad	1.20
Total	<hr/> \$583.68

LIBRARY BULLETIN.

Since last January there have been added to the Library a considerable number of valuable series of Transactions, Proceedings, Journals and Reports, and, as well, some eighty engineering treatises and text-books. It is the intention of the Library Committee to have a printed catalogue of the whole Library prepared and distributed in the near future, but, in order to encourage the immediate use of the Library, this Bulletin is issued. For the sake of brevity, only the more important series of publications are mentioned specifically.

Those desiring to consult the Library will find at the headquarters of the Branch, 90-96 King Street West, a complete card catalogue according to authors and subjects covering not only the books, periodicals and reports belonging to the Branch, but the libraries of the Engineers' Club, Ontario Association of Architects and Association of Ontario Land Surveyors. To all these libraries members of the Branch have access.

The eighty books added to the Library comprise the most recent works on Bridge Engineering, Cement and Concrete, Ceramics, Chemical Engineering, Electrical Engineering, Foundations, Heating and Ventilating, Highway Engineering, Hydraulics, Mechanical Engineering, Metallurgy, Railway Engineering, Sanitary Engineering, Steam Engineering, Structural Engineering and Water Supply.

The usefulness of the periodic literature in the Library has been considerably increased by the addition of the Engineering Index from 1906 to 1913.

The thanks of the Society are due the following firms and individuals for gifts of books and publications:

To the American Water Works Association for its Proceedings for 1902-1913.

To the Canadian Westinghouse Co. (per Mr. W. M. Andrew) for a bound set of Electric Journal.

To the Electrical News (per Mr. Walter Carr) for 36 volumes on Electrical Engineering subjects.

To the Institution of Electrical Engineers of Great Britain (per Mr. Lawford Grant) for a set of its Journals for 1904-14.

To the Böving Company of Canada and to Messrs. Edmund Burke, W. F. Ferrier, Arthur Hewitt, A. B. Lambe, A. L. Mudge, C. H. Mitchell, H. G. Nicholls, G. G. Powell and Norman Rankin for miscellaneous books, journals and reports.

In order to further extend the usefulness of the Library, it has been decided to allow members of the Canadian Society of Civil Engineers, in any grade, to borrow single volumes for a period not exceeding seven days. A fine of two cents a day will be levied upon any one who fails to return a borrowed volume upon the due date, and the Committee reserves the right to withdraw borrower's privileges from any member failing to comply with the regulations of the Library.

Those wishing to avail themselves of the privileges offered will consult the Librarian, Mr. R. B. Wolsey, or one of his assistants.

The principal series of Transactions, Proceedings, Journals and Reports, added to the Library by the present Committee are as follows:—

American Ceramic Society,

Transactions, 1912-13.

American Concrete Institute (National Association of Cement Users),

Proceedings, 1905-1911.

American Institute of Electrical Engineers,

Transactions, 1912 (to complete set).

American Railway Bridge and Building Association,

Proceedings, 1903-1913.

American Railway Engineering Association,

Proceedings, 1907-1913.

American Society of Civil Engineers,

Transactions, 1904-1913.

American Society of Mechanical Engineers,

Transactions, 1904-1912.

American Water Works Association,

Proceedings, 1902-1914.

Bureau of Mines of the United States,

Selected Bulletins and Technical Papers.

Canadian Society of Civil Engineers,

Transactions, complete set.

Cleveland Engineering Society,

Journals, 1909-1913.

Dominion of Canada, Department of the Interior,

Set of Standard Topographical Maps.

Dominion and Provincial Governments,

Departmental and Special Commission Reports.

Electric Journal,

1906-1913.

Engineering Experiment Station, University of Illinois,

All available Bulletins.

Engineering Experiment Station, Iowa State College of Agriculture
and Mechanic Arts,

All available Bulletins.

Engineers' Club of Baltimore,

Monthly Journals, 1912-1914.

Engineers' Society of Western Pennsylvania,

Proceedings, 1904-1913.

Illuminating Engineering Society,

Transactions, 1909-1913.

- Institution of Electrical Engineers,
Journals, 1903-1914.
- Institution of Mechanical Engineers,
Proceedings, 1905-1913.
- National Electric Light Association,
Reports, 1905-1913.
- New York City, Board of Water Supply,
Reports, 1906-1912.
- New York State Public Service Commission,
Reports, 1909-1912.
- New York State Water Supply Commission and Conservation
Commission,
Reports for 1910-1912.
- North of England Institute of Mining and Mechanical Engineers,
1900-1913.
- Wisconsin Railway Commission,
Reports, 1907-1912.

The Committee on the Library,

W. ALMON HARE,
A. L. MUDGE,
C. R. YOUNG, *Chairman*.

The report of the Ottawa Branch was read by Mr. A. B. Lambe.

REPORT OF OTTAWA BRANCH.

On behalf of the Managing Committee of the Ottawa Branch, we take pleasure in submitting the following report for the past year:—

ANNUAL MEETING

This was held as usual in the early part of October last, and resulted in the election of the following officers for the season 1914-15, namely:—

Chairman—A. St. Laurent.

Managing Committee—M. F. Cochrane, for 1914-15; R. de B. Corriveau, for 1914-15-16; W. J. Dick, for 1914-15; Alex. Gray, for 1914-15-16; W. S. Lawson, for 1914-15-16.

Secretary-Treasurer—A. B. Lambe.

The Standing Committees were afterwards appointed as follows, namely:—

Entertainment—W. J. Dick (Chairman), C. R. Coutlee, G. G. Gale.

Papers—W. S. Lawson (Chairman), J. B. Challies, Alex. Gray.

Rooms—M. F. Cochrane (Chairman), W. F. McK. Bryce, R. de B. Corriveau.

The District Councillors are:—D. MacPherson, for 1912-13-14; S. J. Chapleau, for 1913-14-15; R. F. Uniacke, for 1914-15-16.

The District Representative on the Nominating Committee is L. W. Gill, Kingston, Ont.

MEMBERSHIP

As was the case in the year 1913, we have had a great many changes in our 1914 membership, which now stands as follows, the corresponding figures at the end of 1913 being given for comparison. It will be noted that they show a slight decrease during the past twelve months:—

	December, December,	
	1913.	1914.
Honorary Members	3	3
Members	51	46
Associate Members	116	113
Ottawa Associates	24	21
Juniors	15	28
Students	28	16
Totals	237	227

We much regret having to record the deaths during the year of three members, namely:—Messrs. Alex. Campbell, Ambrose Duffy and T. H. Schwitzer.

HONOR ROLL

We are glad to be able to report that many of those enlisting from Ottawa for active service are Members of the Society and of this Branch. The names so far reported to us are:—Messrs. A. A. Anderson, W. E. Blue, J. L. H. Bogart, F. J. Delaute, A. Nowlan, S. D. Parker, R. W. Powell, J. H. Ramsay, J. C. Stewart, and R. S. Stronach.

BRANCH BY-LAWS

At the Annual Meeting the By-Laws of the Branch were revised in certain particulars, in order to more fully meet present conditions.

PAPERS AND MEETINGS

As was the case during last year, our Paper Committee has been successful in presenting to the Branch a number of excellent speakers. The following is a list of meetings held in the past twelve months:—

“Some Accessories of a Battleship”—H. A. Dupré, Ottawa.

“Wireless Telegraph”—C. P. Edwards, Ottawa.

“Centrifugal Pumping Machinery”—J. W. Drysdale, Glasgow, Scotland.

“The Welland Ship Canal”—J. L. Weller, St. Catharines, Ont.

“Structural Steel Design”—E. S. Mattice and W. F. Gronau, Montreal.

“The Engineer and the Public”—W. J. Francis, Montreal.

“Naval Guns”—R. M. Stephens, Ottawa.

“Submarines”—P. C. W. Howe, Ottawa.

On some occasions, the audience was too large for the usual branch quarters, and we are indebted for the use of meeting rooms to the Commission of Conservation, the Carnegie Library and the Normal School.

During the first part of the year two papers per month were given, but latterly there was one evening meeting and one luncheon per month, the latter accompanied by a ten-minute address.

Our Managing Committee meets regularly on the Monday preceeding each first monthly meeting, with special meetings at other times if necessary.

ENTERTAINMENT

In view of general conditions this year it was decided not to have the regular dinner this season, but to have the monthly luncheons referred to above.

ROOMS

As the rooms formerly occupied were not very suitable for the purposes of the Branch, they were given up early in the spring, and present conditions do not seem to warrant engaging any others.

In the meantime, as their functions were so interlaced, the Library and Rooms Committees have been merged.

FINANCES

It is of course to be expected that present conditions will adversely affect our finances, in common with those of all other similar organizations, but notwithstanding the general situation, they are gradually improving.

All of which is respectfully submitted.

A. ST. LAURENT, Chairman.

A. B. LAMBE, Secretary-Treasurer.

On motion by Mr. Lambe, seconded by Mr. A. T. Phillips, the report was adopted.

Mr. L. W. Gill read the following Report from the Kingston Branch:—

REPORT OF THE KINGSTON BRANCH.

The Executive of the Kingston Branch begs to submit the following report for the year 1914:—

MEMBERSHIP

Members	8
Associate Members	8
Juniors	5
Associates (Branch)	6
Students	15

42

It is with much regret that we have to note the death of one of our well-known senior members, namely, Prof. A. K. Kirkpatrick. It is also with regret that we note the absence of several of our active members who have volunteered for overseas service in the present war, namely, Major H. T. Hughes, Major Alexander Macphail, Captain Malcolm, and Mr. D. S. Ellis, all of whom are in the Engineering Service. Several others of our membership have taken up military duties in connection with our Home Service.

Under the above circumstances this Branch will probably be excused for not meeting more than once since the war broke out.

Last February Prof. Kirkpatrick gave a very interesting paper on the Prince Edward Island Railway Ferry, which elicited considerable discussion.

Regarding the matter of finances, we may say that we are not under any very heavy obligations. Queen's University has kindly given the use of its Engineering Library free of charge. Under these circumstances we are able to offer small prizes for student papers with the view of encouraging young men to become interested in the Society.

The annual meeting of the Branch was held on January 25th, 1915, and the following officers were elected for the year:—

Chairman—W. P. Wilgar.

Secretary-Treasurer—L. W. Gill.

Executive Committee—E. Harvey, R. O. Sweezy, G. C. Wright.

Respectfully submitted,

A. MACPHAIL, Chairman.

L. W. GILL, Secretary-Treasurer.

On Motion by Mr. Gill, seconded by Mr. F. H. Pitcher, the Report was adopted.

Mr. A. Amos read the following report from the Quebec Branch:—

REPORT OF THE QUEBEC BRANCH.

The Council of the Quebec Branch of the Canadian Society of Civil Engineers presents the following report for the year 1914:—

ROLL OF THE BRANCH.

At present, the membership stands as follows:—

Members	20
Associate Members	41
Associates (Branch)	2
Juniors	14
Students	21
	—
Total	98

The Annual Meeting of the Quebec Branch was held on the 19th January, 1914, under the Presidency of Mr. A. R. Décary.

The following officers were elected:—

President—A. Amos.

Secretary—J. desR. Tessier.

Councillors—Stuart S. Oliver, A. Léofred, Robert A. Black.

The Past Presidents were:—P. E. Parent, W. D. Baillargé, A. R. Décary.

MEETINGS.

The Quebec Branch held six Business Meetings during the year 1914.

Papers, etc., submitted by the Council of the Society and by the different Branches, were discussed.

Two very interesting lectures were delivered during the year: the first by Mr. A. Surveyer, Civil Engineer, of Montreal, on “La mise en oeuvre des chutes d’eau et les prix de revient comparatifs dans divers pays.” This paper was later translated into English and read at one of the meetings in Montreal. This lecture was illustrated by lantern slides.

The second lecture was given by Mr. T. A. J. Forrester, Civil Engineer, on “Cast Iron vs Steel Mains for water supply.”

During the past year, one candidate, Mr. R. Martin, presented himself for examination in Railway Engineering.

The following are the officers of the Branch for the year 1915:—

President—S. S. Oliver.

Secretary-Treasurer—Ivan E. Vallee.

Councillors—T. A. J. Forrester, Gabriel Henry, J. F. Guay.

Respectfully submitted,

ARTHUR AMOS, Chairman.

J. DESR. TESSIER, Secretary-Treasurer.

On motion by Mr. A. Amos, seconded by Mr. T. A. J. Forrester, the report was adopted.

The Secretary read the following report from the Victoria Branch:—

REPORT OF THE VICTORIA BRANCH.

The Victoria Branch herewith beg to submit their Annual Report for the year 1914.

The Annual Meeting of the Branch was held on December 9th, and the following officers were elected for 1915, namely:—

Chairman—D. O. Lewis.

Vice-Chairman—H. W. E. Canavan.

Treasurer—F. C. Green.

Secretary—R. W. Macintyre.

Executive—A. E. Foreman and A. W. R. Wilby, together with the four officials named above.

Auditors—E. H. Harrison and H. A. Icke.

Legislation Committee—H. W. E. Canavan (Chairman), F. A. Devereux, F. C. Gamble, E. H. Harrison, W. M. Young.

Eight meetings of the Branch were held during the year, with an average attendance of seventeen, and the following papers were given, all being illustrated with lantern slides:—

January 8th—"Some Engineering Works in British Columbia," (2nd part). F. C. Gamble, Vice-President Can.Soc.C.E.

March 12th—"Modern Guns," Captain N. C. Sherman, J.Can.Soc.C.E.

April 9—"Modern Irrigation in British Columbia." H. W. E. Canavan, M.Can.Soc.C.E.

November 17th—"Modern Lift Bridges." J. Lyle Harrington, M.Can.Soc.C.E.

December 11th—"Victoria Breakwater Construction." J. S. MacLachlan, M.Can.Soc.C.E.

New members admitted to the Branch totalled seventeen (17), but the removal of an equal number leaves a net total of eighty (80), which equals that of 1913. The corporate membership was increased by nine (9), whilst Juniors, Students and Associates decreased to the same figure.

Seven (7) evening receptions were held in the Branch rooms during the winter months, which were well attended by members with their families, and have resulted in the promotion of closer intercourse and acquaintanceship, amongst the profession in Victoria.

The Third Annual Convention of B. C. members of the Can.Soc.C.E., was held in Victoria on December 12th, when Mr. G. R. G. Conway, Chairman of the Vancouver Branch, read a paper on "Legislation and the Engineering Profession," which was followed by a most instructive discussion on this subject. During the afternoon the members motored out to the Albert Head Quarries,

where rock for the Victoria Breakwater is being taken out, and were entertained by Mr. H. A. Elgee, Engineer in charge.

The Annual Convention dinner took place at the Empress Hotel in the evening, with an attendance of eighty-three (83) members and guests. Eight (8) members of the Branch have enlisted for service at the front to date, and others expect to follow them shortly.

Respectfully Submitted,

D. O. LEWIS, Chairman.

R. W. MACINTYRE, Secretary.

On motion by Mr. E. Marceau, seconded by Mr. J. A. McCarthy, the report was adopted.

The Secretary read the following report of the Calgary Branch:—

REPORT OF THE CALGARY BRANCH

On behalf of the Calgary Branch we beg to report as follows:—

During the year there were five general business meetings of the Members of the Branch, including the Annual Meeting on December 5th.

The Executive Committee held nine business meetings, and the Committee on Credentials and Applications held five business meetings. In addition to this there was one informal meeting of the members on September 22nd, to arrange for the entertainment of engineer delegates at the International Irrigation Congress.

Eleven dinners were given by the Branch at Cronn's Rathskeller, with speakers as follows:—

Date.	Name of Speaker.	Subject.
Jan. 9.	W. G. Craig, M.Am.Soc. C.E., City Engineer, Calgary, Alta.	"Modern Pavements."
Jan. 23.	S. G. Porter, M.Can.Soc. C.E., Calgary, Alta.	"The Engineer and his Relations to Society."
Feb. 6.	H. A. Moore, M.Can.Soc. C.E., Calgary, Alta.	"Kananaskis Falls Power Development."
Feb. 20.	D. W. Hays, M.Am.Soc. C.E., Medicine Hat, Alta.	"Irrigation Engineering."
Mar. 6.	H. J. Duffield, M.Can.Soc. C.E., Calgary, Alta.	"The Railways of South ern Peru."

- | | | | | |
|------|-----|-------------------------------------|--|----------|
| Mar. | 20. | F. H. Peters, M.Can.Soc. | "The Georgian Bay Can-
C.E., Calgary, Alta. | al." |
| Apr. | 3. | H. B. Muckleston, M.Can. | "Movable Dams." | |
| | | Soc.C.E., Calgary, Alta. | | |
| Apr. | 9. | W. J. Francis, M.Can.Soc. | "The Engineer and the
C.E., Montreal, Que. | Public." |
| Oct. | 6. | F. H. Newell, M.Am.Soc. | "Lessons for Engineers." | |
| | | C.E., Washington, D.C. | | |
| Oct. | 6. | H. N. Savage, M.Am.Soc. | " " " | |
| | | C.E., Great Falls, Mont.,
U.S.A. | | |
| Oct. | 6. | D. W. Ross, M.Am.Soc.C.E., | " " " | |
| | | San Francisco, Cal., U.S.A. | | |
| Oct. | 6. | Wm. Young, M.Can.Soc. | " " " | |
| | | C.E., Victoria, B.C. | | |
| Nov. | 6. | Wm. Pearce, M.Can.Soc. | "Irrigation in Egypt." | |
| | | C.E., Calgary, Alta. | | |
| Dec. | 30. | A. H. Clarke, K.C., M.P., | "Drainage Laws." | |
| | | Calgary, Alta. | | |

In addition to this a luncheon was given previous to the Annual Meeting on December 5th, at the Palliser Hotel, at which several of the members of the Branch spoke.

The members of the Branch visited the Canadian Pacific Railway Company's shops at Ogden, on March 6th.

S. G. Porter and B. Russell attended the Convention of the Western Canada Irrigation Association at Penticton, B.C., on August 10th to 12th, as delegates for the Parent Society and H. R. Carscallen attended as a delegate for this Branch.

About twenty members of the Branch attended the sessions of the International Irrigation Congress on October 5th to 9th, the Secretary of the Branch being authorized to appoint all of them delegates for the Branch, by special arrangement with the Executive of the Congress.

The dinner on October 6th was given for the members of the profession who were delegates to the Irrigation Congress. There were seventy-seven engineers present, of whom twenty-one were guests of the members of the Branch.

It may be worthy of mention that the Council of the City of Calgary asked the Branch to select one of its members for appointment to the Committee selected by the Council to revise the build

ing code of the City of Calgary. As a result, H. B. Muckleston is a member of that Committee.

The Annual Meeting of the Branch was held on December 5th. The Secretary-Treasurer's report at that time showed that the receipts during the year ending November 28th, 1914, had been \$157.50, the expenditures \$126.60, and that the Branch had a balance of \$299.90 in the Molsons Bank. The following officers were elected for the ensuing year:—

Chairman—F. H. Peters.

Secretary-Treasurer—P. M. Sauder.

Executive Committee—R. J. Burley, H. B. Muckleston, and P. J. Jennings. (The Chairman and Secretary-Treasurer are ex officio members of this Committee).

Auditors—J. S. Tempest and F. G. Cross.

The present membership of the Branch is sixty-two, distributed as follows:—

Members	13
Associate Members	35
Juniors	3
Students	6
Associates of the Branch	5
	—
	62

Arrangements are being made for a reference library and a register of members who are available for employment.

The members of the Branch have taken a keen interest in the affairs of the Branch and the Society, and the attendance at the dinners has been very good, averaging about forty-five members and guests. The new Executive Committee therefore proposes to continue the programme of fortnightly dinners during the winter months. It is felt, however, that engineers should mix more with men of other professions and business, and the speakers in future will not, therefore, all be members of the engineering profession. In order also to facilitate the business of the Branch, regular business meetings will be held immediately after and at the same place as the dinners.

This Branch feels that the Annual Meetings of the Society should occasionally be held in the West, so as to give all the members of the Society an opportunity to attend at least some of the

meetings, and would like to see arrangements made for next year's meeting to be held in the West.

Respectfully submitted,

F. H. PETERS, Chairman.

P. M. SAUDER, Secretary-Treasurer.

Calgary, January 20th, 1915.

On motion by Mr. R. B. Rogers, seconded by Mr. William Kennedy, the report was adopted.

The Secretary read the report of the Edmonton Branch:—

REPORT OF THE EDMONTON BRANCH.

The Executive of the Edmonton Branch begs to forward herewith report covering the inception and activities of this Branch of the Society up to December 31st last.

This Branch was authorized following a petition of sixteen Corporate Members of the Society residing in this vicinity. An informal meeting was held by those interested in accordance with this authorization on May 7th last, to carry out further steps towards the formation of this Branch. At this meeting the following officers were elected pro tem:—

Chairman—Professor W. Muir Edwards,

Secretary-Treasurer—L. B. Elliot,

and an Executive Committee consisting of the Chairman, Secretary-Treasurer and the following Members: J. Chalmers, J. D. Robertson, W. R. Smith, D. J. Carter, R. H. Parsons. This Executive, as organized, proceeded, following this meeting, to draft by-laws governing the activities of the Branch. These were drawn up and presented for consideration at the first regular meeting of the Branch, which was held in September 23rd last. These by-laws were finally adopted with some amendments at this meeting. The officers elected at the organization meeting were also re-elected to serve until their successors took office at the first Annual Meeting of the Branch. It was further decided at this meeting that future meetings should be held on the first and third Wednesdays of each month, each alternate one to be of a social nature.

At a meeting of the Executive of the Branch, which was held on the 9th of October last, the following Committee on Papers was appointed:—

Chairman—J. Chalmers,
A. J. Latornell,
C. A. Robb.

This Committee has arranged for an interesting series of technical papers to be read each month during the winter season. The following papers of this series have already been delivered at regular meetings:—

“The Prevention of Electrolysis Due to Street Railway Tracks,” by R. H. Parsons.

“Depreciation as Applied to Public Utilities,” by J. Chalmers.

“The Contribution of Science to Modern Warfare,” by Professor W. Muir Edwards.

“Military Engineering,” by D. Donaldson.

Several of the above papers were illustrated with lantern slides, and all were of great interest to the Engineers. The programme as arranged for covering this season, calls for three more papers. At the last meeting, which will be held in the month of May, the general business will be taken up relating to the welfare of the Branch and of the Society.

The Branch has taken an active interest in all matters pertaining to the Society as a whole, especially with regard to the proposed by-laws which have been presented for consideration since our organization. We have communicated with and got the views of the various other Western Branches with regard to the matters affecting these Branches, and of the members of the Society in this part of the Dominion.

Our Branch membership is at present as follows:—

Members	9
Associates	1
Associate Members	27
Students	4
Juniors	7
Branch Associates	6

This makes a total membership of fifty-four. We beg to enclose herewith a list of members.

After the organization was effected, the Chairman, Professor W. Muir Edwards, announced that the University of Alberta had granted the use of one of their lecture rooms for the regular meetings of the Branch. Accordingly we have held these meetings since

our organization, at the University. We, however, look forward to the time when the Branch will have rooms of its own with a library in connection, for the use of the Members.

A feature of our programme has been the fortnightly meetings which have taken the form of informal dinners, followed by discussion of Society affairs. We have found that these informal dinners give the Engineers a better opportunity to become acquainted with one another, than is possible at the regular meetings.

As the first Annual Meeting of the Branch will not be held until October next, no report in regard to finances has been prepared.

Respectfully submitted,

W. MUIR EDWARDS, Chairman.

L. B. ELLIOT, Secretary-Treasurer.

On motion by Mr. E. W. Oliver, seconded by Mr. F. H. Pitcher, the report was adopted.

The Secretary read the following report of the Manitoba Branch:—

REPORT OF THE MANITOBA BRANCH.

The Manitoba Branch of the Canadian Society of Civil Engineers begs to submit the following annual report for the year 1914.

The officers for the year 1914 were as follows:—

Chairman—E. E. Brydone-Jack.

Executive Committee—W. L. MacKenzie, F. Lee, D. A. Ross.

Secretary-Treasurer—G. E. Bell.

MEETINGS.

The following papers were read and discussed at the regular meetings of the Branch:—

- | | |
|---------------|---|
| Dec. 4, 1913. | "Reminiscences," by Mr. T. Turnbull, M.Can.Soc. C.E. |
| Jan. 8, 1914. | "The C.N.R. Bridge over the North Saskatchewan River at Prince Albert," by Mr. W. L. MacKenzie, M.Can.Soc.C.E., and Mr. T. W. White, A.M.Can Soc.C.E. |

- Feb. 5, 1914. "The Panama Canal," by Mr. H. N. Ruttan, M. Can.Soc.C.E.
- Mar. 5, 1914. "Concrete Pavements," by Mr. A. A. Young, A.M.Can.Soc.C.E.
- Apr. 2, 1914. "Some Uncertainties in the Design and Construction of Reinforced Concrete," by Mr. H. Edwards, A.M.Can.Soc.C.E.
- May 7, 1914. "The Relations of the Engineer to the Public Utility Commission Judge," by Mr. H. A. Robson, Public Utility Commissioner for Manitoba.
- Sept. 17, 1914. "Concrete," by Mr. J. H. Fuertes, M.Am.Soc.C.E.
- Oct. 8, 1914. "The Winnipeg Water Supply with Especial Reference to the Shoal Lake Project," by Mr. W. G. Chace, M.Can.Soc.C.E.
- Nov. 12, 1914. "Some Engineering Experiences in South America," by Mr. D. L. Derrom, A.M.Can.Soc.C.E.

The average attendance at these meetings was thirty-eight.

SECTIONS.

The Electrical Section, the Chairman of which was Prof. E. P. Fetherstonhaugh, held seven meetings during the year, at which papers were read as follows:—

- Jan. 25, 1914. "Illumination Calculations," by Prof. E. P. Fetherstonhaugh.
- Feb. 11, 1914. "Transmission Line Calculations." Reading of Mr. Julian C. Smith's paper.
- Mar. 19, 1914. "Electric Rates," by Mr. R. A. Sara.
- May 27, 1914. "High Tension Insulators," by Mr. A. O. Austin.
- June 3, 1914. Dinner and Election of Officers.
- Oct. 14, 1914. "Storage Batteries," by Mr. J. F. S. Madden.
- Oct. 28, 1914. "Electrolysis," by Prof. A. F. Ganz.

The Mechanical Section, Chairman, Mr. A. C. Frith, also held three meetings, at which the following papers were read:—

- "Ventilation," by Mr. T. L. Roberts.
- "Efficient Shop Methods," by Mr. E. T. Spidy.
- "Iron and Steel Manufacture," by Mr. R. R. Neild.

The total membership of the Branch now numbers 297, which is made up as follows:—Members 46, Associate Members 103, Associates 1, Juniors 25, Students 57, Local Associates 65.

The by-laws of the Branch were amended during the year by increasing the time by three months during which meetings would be held, thus making the active season from September to May inclusive.

It was also decided that the officers of the Branch should take office in May instead of in January, although they would still be elected at the annual meeting to be held in December. The officers for 1914 were re-elected to hold office until May, 1915, and the following were elected to hold office from May, 1915, to May, 1916:—

Chairman—W. G. Chace.

Executive Committee—E. P. Fetherstonhaugh, Frank Lee, W. A. Duff.

Secretary-Treasurer—G. E. Bell.

The Treasurer's report showed a balance in hand at the end of the year of \$460.29.

GEO. E. BELL, Secretary-Treasurer.

On motion by Mr. W. J. Francis, seconded by Mr. J. A. Burnett, the report was adopted.

The President congratulated the Society on the healthy condition of the Branches as indicated by the reports which had just been read. The improvement in the Toronto Branch was especially gratifying.

REPORTS OF COMMITTEES.

The President requested the attention of the Meeting to the reception and consideration of reports of Committees.

BOARD OF EXAMINERS.

Professor H. M. MacKay in presenting the report stated that two members of the Board, Prof. M. C. J. Beullac and Prof. Flahault, were now serving their country in France, and he wished to pay a tribute to their thoughtfulness by stating that before they had left the country they had made every possible provision for carrying on their work during their absence.

Examinations were held in May and November and the following table summarizes the results:—

Subject.	Number of		
	Candidates.	Passed.	Failed.
Elementary Mathematics	3	2	1
Theory and Practice of Engineering.....	6	6	0
Railway Engineering	4	2	2
Hydraulics	1	1	0
Municipal Engineering	4	4	0
Total	18	15	3

The Board received with regret the resignation of Mr. H. M. Jaquays, M.Can.Soc.C.E., Examiner in Mechanical Engineering, whose advice was of the greatest assistance in the initial stages of the work. Prof. A. R. Roberts kindly undertook the duties of Examiner in Mechanical Engineering for the remainder of the year.

Respectfully submitted,

H. M. MACKAY,
Chairman.

On motion by Prof. MacKay, seconded by Mr. F. H. Pitcher, the report was adopted and the Committee continued.

COMMITTEE ON CEMENT SPECIFICATIONS.

The President stated there was no report from this Committee. The specifications, which had been prepared some years ago, were out of print, and the Council had asked the Committee to consider the advisability of drafting a revised form of specifications. The

matter of continuing the Committee was now before the Meeting. Mr. John Kennedy said that, in his opinion, the Society should have a set of specifications for Cement which could be used in any contract and referred to as the standard specifications of the Canadian Society of Civil Engineers. The President requested that in view of the opinion expressed a motion to appoint a Committee on Cement Specifications should be made, and asked the Meeting to suggest names of members who would serve on such a Committee. Mr. John Kennedy moved the appointment of the Committee, seconded by Mr. E. Marceau. The motion was put to the Meeting and carried and the personnel of the Committee referred to the Council.

COMMITTEE ON IMPROVED ENGINEERING SERVICE.

Mr. Holgate as Chairman of this Committee moved, seconded by Mr. Francis, that the Committee be discharged. The motion was carried.

COMMITTEE ON EDUCATIONAL REQUIREMENTS.

The report of this Committee was read by Mr. E. Marceau as follows:—

At the Annual Meetings of 1909, 1910 and 1911, the Committee on Educational Requirements made various suggestions both in respect of qualifications for admission and of examinations.

These suggestions having been carried into effect, and an Examining Board appointed in 1912, this Committee has not had any meetings since and, therefore, has nothing to report.

However, if the Annual Meeting so desire it might be continued for another year.

ERNEST MARCEAU, Chairman.

Montreal, January 22nd, 1915.

On motion by Mr. E. Marceau, seconded by Mr. F. H. Pitcher, the report was adopted and the Committee continued.

SEWAGE DISPOSAL COMMITTEE.

This Committee did not present a report. A letter was read from Mr. W. Chipman suggesting the continuation of the Committee. Mr. Kennedy expressed his opinion that the Committee had completed its work for the present. On the suggestion of the President the matter of re-appointing the Committee was referred to the incoming Council.

COMMITTEE ON STEEL BRIDGE SPECIFICATIONS.

The following report was read by Mr. C. N. Monsarrat:—

On behalf of the Committee on Steel Bridge Specifications I beg to report progress.

The specification for Steel Railway Bridges—Fixed Spans, has already been issued, and the Committee now have a draft of specification for Fixed Highway Spans in course of preparation, and hope shortly to be able to submit the same for preliminary distribution and discussion.

I regret that the Committee have not been able to get this out in time for the Annual Meeting.

C. N. MONSARRAT,
Chairman.

The President stated that the proposal of the Committee to prepare a specification for Highway Bridges was most important. He also urged the importance of making any necessary revision of existing specifications on Railway Bridges. On motion, the Committee was continued and instructed to carry out the terms of its report. The President suggested that the Council, with the assistance of the Committee, should take active measures towards securing the adoption of these specifications by the Department of Railways and Canals of the Dominion Government and by the Provincial Governments.

COMMITTEE ON CONSERVATION.

The following report of the Committee on Conservation was presented by Mr. James White and taken as read:—

The Committee on Conservation begs to report as follows:—

The most important matter before us, during the past year, has been the question of the collation and publication of gauge records. When referred to Council in 1913, they requested the Commission of Conservation to undertake this work. Two considerations, however, have, thus far, prevented it advancing beyond the preliminary stages. The first is the fact that the engineer who was entrusted with it has been forced to devote practically all his time to the work of compiling and putting through the press the new edition of the "Altitudes in Canada." This publication has, however, now advanced to a stage that will permit the engineer to give nearly all his time to this important work. The other consideration was the outbreak of the war which forced re-

consideration of the proposal to engage additional assistance, and, until the amount available for the work of the Commission in 1915-16 is determined, it is not possible to incur any new expenditures.

Thus far, the work has been principally confined to the collection of published records of gauge readings, of lists of gauging stations and of organizations, public and private, that have maintained gauges. The extent of the work will necessitate subdividing it, probably on an orographical basis. Thus, the Maritime Provinces and the portion of the St. John River basin in Quebec might form one division, the St. Lawrence—except the Ottawa basin, which is sufficiently important to receive treatment as a separate unit—would form another. Similarly with the Saskatchewan, Columbia and Fraser, etc., etc.

(2) *Forest Protection.* In the protection of the forests of Canada, it is a pleasure to report distinct advance. As a result of representations by the Commission of Conservation, legislation was had empowering the Board of Railway Commissioners to prescribe regulations for the operation of locomotives during the dry season. Since these regulations were issued by the Railway Commission in 1912, a remarkable improvement has taken place in the railway-fire situation. Since their issuance, they have been enforced in Western Canada and during 1913 and 1914, the organization was extended to Eastern Canada. In the west, an inspection staff, composed of officials of the Department of the Interior and of the Province of British Columbia, has been appointed as officers of the Fire Inspection Branch of the Railway Commission. In the east, officers of the Departments of Lands and Forests of Ontario, Quebec and New Brunswick have been appointed. They have enforced the requirements respecting patrol work and right-of-way clearing along the railways and inspections of fire-protective appliances on locomotives. Thus, the work is carried out by existing fire-protective organizations of the Dominion and Provincial Governments, and duplication of effort is avoided.

When the regulations were approved there was much headshaking and dire predictions were made that they would impose a severe and an unnecessary burden upon the railways. That these predictions have been falsified is due to the conservative administration of the regulations and to the care taken to endeavor to adjust them to suit the convenience of the railways, provided the public interest does not suffer thereby.

As to results, it is sufficient to quote Mr. H. R. MacMillan, Chief Forester of British Columbia, who states that, in 1910, with 1,085 miles in operation outside the Railway Belt, locomotives set

272 fires, causing a loss of \$330,000. During 1913, with a mileage of 2,060 miles, there were 176 fires, with a loss of only \$690. Even, conceding that 1910 was a very dry year, this is a remarkable showing, and is eminently creditable to the railways.

Owing to the long continued dry weather, the fire season of 1914 was the worst since 1910. Thus far, no comprehensive data respecting losses are available. Fire-protective organizations of all kinds were severely taxed and, in most cases, they need strengthening. Larger appropriations are needed, especially for the protection of young forest growth. Along hundreds of miles, especially where there are no timber limits, the railway companies have been the most effective and, in many cases, the only agencies for the extinguishing of fires. Some of the worst fires originated at a distance from the track, and their spread has been checked by the railways, though they were in no wise responsible.

Seven members of the Committee have contributed papers (herewith appended) on various subjects.

Mr. W. H. Breithaupt emphasises the value of forest cover in moderating extremes of stream flow. He cites the Grand River Valley in Southwestern Ontario, where deforestation has been followed by excessive freshets and extreme low water. Mr. Breithaupt advocates the construction of reservoirs on the upper waters to ensure a more even flow throughout the year.

Mr. J. B. Challies advocates the establishment of a Central Bureau as a clearing house for all survey and general engineering information gathered by the various departments of the Government. He also urges the adoption of a uniform method of publication of such information, especially hydraulic or hydrographic data, including stream flow.

Mr. C. R. Coutlee recommends the development of "power areas," which include a few large powers and many small ones; the development to be carried out by the Federal or by the Provincial Government interested therein. He also urges keeping swamps undrained, preventing the settlement of unarable lands, cutting fire guards in the forest, reducing the fire loss in our cities and towns, and that we should write good English.

Mr. C. E. W. Dodwell repeats his recommendation of last year that the tax be removed from denatured alcohol. He also advocates the growing of the sugar-beet in Canada to furnish the raw material for our sugar refineries and urges the construction of better highways to furnish cheaper transportation. He urges the development of our peat bogs and the reduction of the waste in our coal mines.

Mr. P. M. Sauder discusses the co-ordination and extension of hydrographic surveys, referred to in detail in the beginning of this report, and which, therefore, need not be further discussed here.

Mr. R. O. Sweezey states that his appeal of last year on behalf of the Ojibwas met with a prompt and sympathetic response from the Dominion Government. He also contributes interesting articles respecting Conservation of the forests and the work of the new Forest Products Laboratories.

Col. Thos. H. Tracey has contributed a brief statement respecting waste in British Columbia saw-mills.

During 1914, the Commission of Conservation continued the investigation of the agricultural conditions in Canada; whether weeds were increasing, or the reverse, to what extent fertilizers were used, whether rotation of crops was followed. Farmers were advised respecting their operations and instructed respecting the use of such means and methods as would increase the profits of the farm while maintaining its fertility.

The 33 Illustration Farms carried on during 1912-14 have demonstrated their value as an instructing agency, and this work will hereafter be conducted by the Department of Agriculture, and on a very much larger scale.

The Commission has undertaken a "Power" survey of Canada to ascertain the amount of power-steam, water-power, electric, gas and oil used in the various cities, towns, etc., in the Dominion. The data thus collected will give markets and costs of different kinds of power used, and, thus, assist in determining whether other kinds of power could be economically replaced by water-power or by power generated by other means.

A report on the "Water-Powers of Manitoba, Saskatchewan and Alberta" is now in the press, and a similar report on the Water-Powers of British Columbia is nearly ready for the printers. Publication has, however, been delayed by the financial situation.

At the 1914 meeting of the Commission of Conservation, special attention was given to the subject of Town Planning and Housing, both important subjects from the standpoint of public health. One of the primary essentials to human efficiency is the supplying of sanitary and healthy homes to the worker in offices, shops and factories. To carry out a propaganda of town-planning and efficient housing conditions, the services of Mr. Thomas Adams, Senior Town-Planning Adviser to the Government of Great Britain were secured. It is hoped that the various provinces will pass town-planning legislation that will furnish the machinery whereby municipalities will be empowered to carry out these very necessary reforms.

The Commission of Conservation has also investigated many other questions, such as the perpetuation of our great fisheries, the economic development of our mines, the elimination of waste in coal mining, the saving of by-products by the adoption of the by-product coke oven, the investigation of fur-farming, the prevention of the pollution of streams and lakes, the provision of preserves for fur-bearing animals, the protection of migratory and other game-birds, the prevention of typhoid epidemics, the elimination of slums, and etc.

TEN MEMBERS OF THE COMMITTEE HAVE CONTRIBUTED SUGGESTIONS
AND DISCUSSIONS WHICH ARE PRINTED HEREWITH.

Mr. W. H. Breithaupt reports on the situation in the Grand River valley, as follows:—

“Southwestern Ontario, originally, and largely up to sixty or seventy years ago, heavily timbered, is now excellent farming country, and is, due to its natural advantages, geographical and other, becoming in many respects the principal manufacturing district in Canada. Its magnificent timber growth has been largely wasted, mostly inevitably so, to clear the land for agriculture. Only the larger timbers of pine were used, sizes now valuable were largely wasted; the magnificent maple and other hardwoods had mostly one value only, and that was for firewood. Great quantities of it were used for railway locomotive fuel until about 1875. Much of the original forestation could have been retained, with better economy, and this holds particularly in regard to the extensive swamp areas on the higher, and comparatively flat, large area which forms the head watershed of many of the rivers. There is, to some slight extent, activity in reforestation. This will have to be on larger scale than hitherto to have effect to any appreciable extent.

“Precipitation throughout Southwestern Ontario ranges from about 30 to 40 in. per annum, and has not varied appreciably with deforestation, which has, however, changed the former characteristics of stream flow, moderate floods on snow melting in the spring and well sustained flow throughout the year, to destructive spring floods and flow in the low water months, a small fraction of what it was formerly. Flow control of rivers has become the most important conservation question, particularly in the river valleys.

“Municipalities along the valley of the Grand River have agitated the question of conservation of the river for a number of

years. The Hydro-Electric Power Commission of Ontario has carried on special work on the river for the past two seasons, and while this is not yet completed, the determinations so far made give favorable findings as to practicability and economy of flood control, and flow regulation generally, by the method of storage.

"The Commission began work in the fall of 1912, with a reconnaissance survey, extending from the outlet of Lake Erie to the headwaters of the river, and also up all the main tributaries to their headwaters. This survey disclosed three sites on the main river practicable for reservoirs of considerable capacity, the largest one below Elora, two sites on the Conestogo River of fair capacity, two on the Speed River not large enough to be of material benefit, one on the Nith with fair capacity, and one on Whiteman Creek. Levels were carried the length of the survey, and bench marks established, mostly on bridge piers and abutments as far up as Belwood on the main river, and also on the Speed and on the Nith. Eighteen gauges were set, on the main river and tributaries.

"Discharge observations began with July, 1913, and as the spring flood this year was an exceptionally light one no destructive flood discharge has as yet been gauged by the Commission. Discharges are recorded for five stations on the main river, one on the Nith, two on the Speed, one on the Conestogo, one on Fairchild Creek, one on Boston Creek, and one on Galt Creek at Kerr Street bridge.

"Detail topographical survey of the larger reservoir sites has been the work of this year, and it is here that important favorable conditions have been found. The largest practicable basin is on the main river in Pilkington Township, Wellington County, extending from about the southerly boundary line of the township, the northerly boundary of Waterloo County, into the gorge below Elora.

"The general conformation of the Pilkington site is that of a wide, flat-bottomed bowl contracting downstream, rather abruptly, into an elongated neck, a narrow valley with fairly steep sides, and narrowing upstream to the gorge below Elora. Two dam locations were considered, No. 1 dam, some distance down the valley, No. 2 dam, at the neck contraction. No. 1 dam gives considerably the larger capacity, 2,618,563,000 cubic feet as compared to No. 2, 1,920,422,000 cubic feet. The elevation of the river bed at No. 1 dam is 1,065, and water level elevation for the capacity stated is 1,150 feet. Foundation investigations have not yet been made, but limestone is underlying, so that a satisfactory foundation is likely for whatever final dam location may be made in this vicinity. The area of the surface of the reservoir when filled to 1,150 feet elevation will be almost exactly $2\frac{1}{2}$ square miles; allowing for marginal land,

a total of about $2\frac{3}{4}$ square miles, 1,760 acres, would be required. A large part of this land is stream bed or subject to overflow, the rest good farm land, including a number of farmsteads, with their buildings. Two roads and a bridge would have to be relocated. The mean depth of the reservoir when full would be 36.9 feet, maximum depth, 85 feet. Assuming the low water level at elevation 1,080, the dischargeable capacity of the reservoir would be 2,592,-282,000 cubic feet, in round numbers, 2,600,000,000.

"As to cost of this reservoir no approximately close estimates can as yet be made. Land and damage should be a comparatively small part. On the whole, however, from determinations so far made, and in view of the great benefit to be derived, it may be accepted that cost will be fairly within economic practicability.

"The drainage area to this reservoir site is approximately 480 square miles. Assuming an annual precipitation of from 35 to 38 inches and a runoff of 1 foot, the annual runoff would suffice to fill the reservoir five times. The 1913 flood flow in Elora, approximately 13,000 c.f.s. would take $55\frac{1}{4}$ hours to fill the capacity of 2,600,000,000 cubic feet. A considerable stream, the Irvine River, comes in just below Elora. This, with a smaller stream, gives over one-seventh of the drainage area of 480 square miles considered. Assuming the Elora discharge to be correspondingly increased to 15,000 c.f.s., we get exactly two days, 48 hours, of maximum flood flow containable in the reservoir, and this would be the maximum relief afforded for the length of the lower river from this one reservoir.

"It is very desirable to also impound the flood flow coming from the Conestogo. On this tributary no such capacity as that of the Pilkington basin is found practicable, but there is one site, fairly upstream, with drainage area of not over 250 square miles (the drainage area to St. Jacobs is 312 square miles), where it is approximately estimated that a capacity of one billion cubic feet can be obtained. This, together, with the No. 2 Pilkington dam, smaller than No. 1, would give better flood control in the lower river, in that a much larger volume could be held back, even if for a shorter time. In this manner a volume approximately 20,000 c.f.s., the combined flow of both main river and Conestogo tributary could be held back for 24 hours.

"As to maintenance of flow for the low water months, 2.6 billion cubic feet of water would give a continuous flow of 300 cubic feet per second for three months and ten days. In that period rainfall at various times could be expected, making up not alone for evaporation in the reservoir, but also contributing to flow. On the other hand, evaporation appears, as far as observations of stream flow have gone, to have large diminishing effect on runoff, in the Grand

River watershed. At Belwood, drainage, 270 square miles, the mean discharge for the months of August and September, 1913, was only 5 c.f.s.; at Conestogo, drainage area 538 square miles, $24\frac{1}{2}$ c.f.s.; while at Eugenia Falls, on the Beaver River, on the steep slope to Georgian Bay, on the north side of the table-land, the mean discharge for the same time, with only 74 square miles of drainage area, was $30\frac{1}{2}$ c.f.s., a very remarkable difference, due to two main conditions, the much greater declivity of the Beaver drainage area, and the fact that it contains swamps, and is otherwise still largely wooded.

"A feature greatly simplifying the problem on the Grand River is that there is only one large flood in the year, in the spring, on snow melting."

Mr. J. Chalmers contributes the following: —

"In connection with the request for suggestions from members of the Committee on Conservation, the most important matter as I see it at present is the question of reforestation. The district between Winnipeg and North Bay, embracing the Rainy Lake watershed, and the watershed along the north shore of Lake Superior, has at one time been heavily timbered, but owing to devastation by fire, the large timber has been practically all destroyed for years and the country is now growing up with a small mixed growth. This territory, which at one time produced timber of a commercial quality, is quite able to reproduce the same, and the writer can see no better asset for this territory than careful reforestation, as a large majority of the territory is useless for other purposes. Of course it would be a question of years before this timber would be of commercial value, but in the life of a nation the time would be infinitesimal.

"The same argument applies to the country along the west slope and foothills of the Rocky Mountains, where with proper reforestation and care, the forests in time would be replaced in their primeval condition.

"A further benefit to be derived by reforestation is the conservation of moisture and rainfall on the watersheds of the main streams running through the country, giving a more even distribution of the annual precipitation.

"It is realized that this is a very large question, but taken up in a systematic manner and added to from year to year, it is only a matter of time before all this territory, otherwise unproductive, could be made self-supporting, and later a constant source of revenue to the Dominion."

Mr. C. R. Coutlee suggested the following as matters for discussion:—

Combining Hydro-Electric Powers:—There are several power areas which include a few large powers and many small ones. It would be a saving if these powers could be developed by the provincial or the federal government, and hooked up under one management. Large bulks of power could then be offered for manufacturing purposes at suitable points. Many advantages are conferred by having the factory site chosen at a convenient place with the assurance that energy can be brought to it.

Keeping Swamp Areas:—Swamps are valuable reservoirs, and should be withdrawn from cultivation and drainage. Their outlets should be governed by regulation works through which the stored water could be fed out during dry periods.

Unarable Lands:—Care should be exercised to prevent farmers settling on unsuitable lands. Wholesale mistakes of this kind are now being recognized, where after years of hard work the people have degenerated and live in abject poverty. Generally the acid granite soils are not suitable for farming, but grow crops of certain trees and shrubs. Where errors of selection become manifest, the whole population should be bought out and removed.

Cutting Fire Guards:—The forest fire trouble seems due to the immense areas of continuous forests. At times fertile valleys intersect the forest areas, and it is suggested that these should be denuded and open to settlement, with the idea of checking fires. From these areas secondary lanes might be cut, dividing the forest into blocks of convenient size.

Fire Loss:—Possibly the burning of a city block is of more importance than the loss of whole townships of forests. The too free use of soft timber in floors, walls and roofs of dwelling houses is largely responsible for the enormous fire losses in America.

Mr. C. E. W. Dodwell writes as follows:—

“The added responsibilities and the widened field of labor that at the present juncture the Commission of Conservation will doubtless feel to be theirs, will be largely compensated by the magnificent opportunities for signal national service that they will enjoy, as the Intelligence Department of the Commercial and Industrial campaign, the sequel and corollary of the present appalling military conflict.

ALCOHOL.

"Last year I pointed out that, in the United States, the public could buy pyro, or denatured alcohol, for 50 cents per gallon, and that it was a tremendous boon for a host of industrial and domestic purposes.

"The law removing the prohibitory tax of \$2.08 per gallon from denatured alcohol, was enacted by the United States Congress, June 7th, 1906. A supplementary law, passed in 1907, liberalized the terms of the first, and made possible a system of distribution, under which it may be obtained at reasonable prices.

"As an illuminant the relative economy and efficiency of pyro has been demonstrated by the Electric Testing Laboratories of New York, which give the following summary report:—

Description	One gallon will last	Average candle power	Candle power hours.
Alcohol burner	38 hrs. 30 min	5.2	1740
Kerosene lamp	32 hrs. 42 min.	14.8	484

"Therefore, with pyro at 50 cents per gallon, it would be as cheap as kerosene at 15 cents per gallon, and a 45 c.p. pyro lamp would cost less than one and a third cents per hour.

"As a source of light, electricity is cheaper than alcohol, acetylene, gas, or oil, a 45 c.p. electric lamp, costing less than 1 cent per hour. But, in villages and country districts, where electricity is not available, the alcohol lamp is *facile princeps*, on account of cheapness, health, convenience and low cost.

"When used as fuel for cooking purposes, pyro is cheaper, cleaner, and far more convenient than coal, wood or oil. There are in general use in the United States many forms of stoves, for kitchen and table use, boilers, bakers, broilers, toasters, etc. Experiments at the Housekeeping Experimental Station at Darien, Conn., go to show that one gallon of alcohol is sufficient to do all the cooking for a family of four persons for seven days.

"For heating purposes, on a small scale, there are portable steam radiators of about 20 square feet heating surface, that will heat a 12' x 14' room to a comfortable temperature, without the offensive odor and the vitiation of air, inseparable from the usual portable oil heater.

"As a source of power it seems not improbable that alcohol will, in the not very remote future, supersede gasoline or petrol, at

least partially. Gasoline, being a distillate from petroleum, has a certain fixed and definite limit to quantity, and, though its exhaustion may be remote, in time, the fact has a continued and marked tendency to increase its price ultimately to its limit of economical use as a source of power. The relationship between its supply and demand, therefore, is not a constant. In the last dozen years its price has risen from about 18 cents to about 30 cents per gallon.

"Early this year the Imperial Motor Transport Council of London, appointed a Committee for the purpose of considering the high price of petrol.

"The case presented to this Committee was as follows:—

"With the increasing use of motor vehicles the demand for fuel goes up, but the supply diminishes. Another fuel must be found, and alcohol, which can be produced at about half the present price of petrol, is held to be the most promising substitute. When mixed with a small proportion of benzol it is as effective as petrol—given the right engine.

"It was the purpose of the Committee to ask the Government to modify their conditions respecting alcohol, when used for power purposes. The question of an efficient alcohol engine would form the subject of experiments to be carried out under the control, and at the expense of, the Committee.

"With alcohol there is no limit of potential supply, for practically every vegetable substance in nature that is capable of fermentation is capable of yielding alcohol, and therefore, as to this article the relationship between supply and demand is a constant.

"Among the more direct, convenient and plentiful sources of alcohol may be mentioned grain, molasses, potatoes, beets, sawdust, wood pulp and peat. As to the three last of these substances, their economic possibilities will, no doubt, be investigated by the Forest Products Laboratories. A year or so ago a newspaper item stated that a large English company had commenced the production of acetone and fusel oil from saw-dust, by a simple process of fermentation. These are valuable substances, and if alcohol can also be produced, the thousands of tons of saw-dust now lying waste all over the country will have considerable and hitherto unsuspected value.

"In Canada, molasses as a source of alcohol is unimportant. Most of the alcohol used in the United States and Canada is distilled from grain, and that it can be done economically and on a commercial basis is evidenced by the fact that within the last few years several large American distilleries that formerly turned out whisky, have taken up the production of pyro. That in so doing

they were actuated rather by business principles than by temperance motives is a reasonable inference.

"I am not aware that any considerable quantity of alcohol has been produced in Canada from potatoes, but in Europe, notably in Germany, it is an extensive and presumably profitable industry.

"If the production of alcohol from potatoes, and their growth for this purpose, are remunerative industries in Germany, it is difficult to see why they could not be profitably introduced in Canada, where the condition of soil and climate are eminently suitable.

"In every province of Canada there are many factories for the production of jams, and preserved fruits and vegetables. In most cases the refuse, comprising many tons of pulp, skins, peelings, cores, seeds, etc., could be more profitably used as a source of alcohol than as fuel, manure or swine feed. A couple of years ago the papers reported that in the west many thousands of bushels of wheat were spoiling (incipient fermentation) in store-houses and elevators, for lack of, or delay in, transportation facilities. Little of the value of this grain need have been lost if it could have been hurried to the nearest distillery for the production of pyro. In December, 1913, it was stated by a Member of Parliament that about a million barrels of potatoes, valued at \$1,250,000, were going to waste in New Brunswick on account of the United States markets being barred to Canadian potatoes. If they could have been made immediately available as a source of alcohol there need have been no waste.

"I deem it unnecessary to further elaborate this subject or to go into the details of the alcohol values of the several substances mentioned, even were such figures accessible. The chief object of this note is to point out to the Committee the importance and great desirability of prevailing upon the Government to make such changes in existing tariff and excise as will permit the public to obtain cheap alcohol for industrial and domestic use, as in the United States and other countries.

"I am in pursuit of information as to the effect of the reduction of duty and excise on denatured alcohol on the revenue of the United States, and also as to the possible encouragement to illicit distilling that might be feared by our Government as a result, and at a future time I shall submit a supplementary note.

BEET SUGAR.

"Attention is called to the importance of this subject in an article in the '19th Century Review' for October, 1914, by J. W. Robertson-Scott, 'Opportunities of the War, An Urgent Plea for State Sugar Factories,' from which most of my figures are taken.

"The total consumption of sugar in the United Kingdom in 1913 was, in round figures, 2,000,000 tons, or nearly 100 pounds per head of population. Of this total, 80%, or nearly 1,600,000 tons was beet sugar, of which 1,300,000 tons came from Germany and Austria.

"In Great Britain, in 1910, the cultivation of sugar beet was seriously undertaken, and a factory was established at Cantley, in Norfolk. Experiments in the growth of beets gave as a result 25½ tons of roots per acre and 15½ per cent. of pure sugar in the juice. In Canada, as the result of experiments, carried on at a number of our Experimental Farms, to which further reference will be made, the yield per acre of roots is somewhat less and the percentage of sugar in the juice somewhat greater. In *France* the sugar yield of the roots is 11.6%, and in *Germany* 12.8% of the weight of the roots. One ton of beets has approximately the same sugar value as a ton of sugar cane. In *Germany* and *Austria* the net yield of sugar per acre of beets is 3,600 pounds, and the average cost of production \$2.00 per hundred pounds. In *Canada* the wholesale price of refined sugar just before the war was \$5.10 per hundred pounds. It is now about \$7.00, with a probability of a slight further rise before the end of the war, and little likelihood of the return to the ante-war figure for several years.

"In the November issue, 1914, of the '19th Century Review,' Mr. Robinson-Scott has another article on the subject, 'Shall We Be Punished For Making Sugar,' and in this he has the following *Estimated Costs and Returns per Acre of Sugar Beets*.

	£	s.	d.
13 tons washed, topped and delivered at £1.....	13	0	0
Leaves and tops	0	15	0
Value of portion of beet pulp returned free, say 15s.	0	15	0
Free seed, say 20 lb. at say	0	7	0
Value of portion of lime returned free.....	0	3	0
	<hr/>		
	15	0	0
Total cost of producing crop and delivering to factory. (This could often be less)	12	0	0
	<hr/>		
Net cash profit as soon as roots have been delivered, say in October or November	£3	0	0

"These figures, which are the farmer's aspect of the question, were published some years ago, and can be improved upon to-day. £3, or \$15 per acre net profit is not, of course, as much as may be obtained from certain forms of fruit raising, or intensive culture in

high-class vegetables, etc., but for large scale farming, at least on such land and in such localities as are not adapted for either fruit raising or other intensive culture, it is a fair return on agricultural investment.

"In the Report for the year ending March 31st, 1913, of the operations of ten experimental farms throughout the country, (Appendix to the Report of the Minister of Agriculture) detailed results are given of the experiments carried on during the past thirteen years, to determine the suitability of the soil and climate of the country for raising sugar beets. Tables are given, showing the yield per acre, the percentage of juice in the roots, and of sugar in the juice. The report says.—

" 'A survey of the whole series shows remarkably satisfactory results.....It has been conclusively shown from this investigation, which has been carried on systematically since 1901, that beets, suitable for factory purposes, can be grown at widely distant points in the Dominion.'

"The writer of the articles cited above further says, (19th Century Review, October, 1914, page 881):—

" 'The war, during which so large a proportion of our sugar must be cut off, will not be a short one, and when it is over it must leave the beet sugar industry of Germany Austria and other parts of Europe in a crippled condition. There is, therefore, an extraordinarily favorable chance of establishing in this country the production of a necessary article of food, for which we ought never to have relied too largely on the foreigner.'

"There are several ways in which the Federal Government could legitimately establish the beet sugar industry, (a) By building and operating factories as Government institutions, an unprecedented procedure, but in the circumstances not out of the question, (b) By lending the necessary funds, at low rate of interest, and under suitable conditions and restrictions, to companies able and willing to take up the business on a large scale, and (c) By increased duties on imported sugar, with or without bounties on Canadian-made beet sugar.

"As to the quantity of beet sugar actually produced in Canada, no detailed figures appear to be available, but there is one factory in Wallaceburg, Ont., and another in Raymond, Alberta, and between them I believe they turn out from 5,000 to 10,000 tons annually. That the industry is still more or less alive may be inferred from the fact that in the fiscal year ending March 31st, 1914, nearly

\$61,000 worth of machinery, for the manufacture of beet sugar, was imported into Canada.

"There is one obstacle that I foresee in the way of the development of the industry in Canada, and that is the high cost of labor. This difficulty is common to several prospective developments of our resources, and there is no doubt but that it is a serious one. Other difficulties that occur to me are the prodigality of nature and the sparseness of the population of the Dominion (about $2\frac{1}{2}$ people per square mile, as against 372 in the United Kingdom, 330 in Germany, 191 in France, and over 600 in Belgium). But if these circumstances are discouragements they are also incentives to continued activities and exhaustive research in the exploitation of the natural resources and industrial capabilities of our great country.*

HIGHWAYS.

"If agriculture is the backbone of a country, transportation routes, whether wet or dry, may aptly be called its arteries. It should not require a high order of intelligence to understand that good roads are of immense importance to all the inhabitants of a country, but especially to the farmer. It should not require a mathematician to appreciate the fact that the value of a barrel of apples or a bushel of potatoes varies inversely as the cost of carrying it to market.

"I have little knowledge of the conditions of public highways in either parts of the Dominion, but in Nova Scotia, in the past half-century there has been money enough wasted on the public roads to build excellent macadamized highways nearly all over the Province, and at this date, with few exceptions, they are little short of a disgrace to a supposedly civilized country. The reasons for this deplorable state of things are: that the money grants are expended under such circumstances, and under supervision of such a character, that the only perceptible result is that a bad road is made worse. The favorite method of repairing or remaking a road seems to be to plough the side ditches, and then throw the re-

*London Daily Mail, November 21st, 1914.

'That the war will settle the English beet sugar question one way or the other authoritative opinion does not doubt, and this is the time when any efforts which the State is going to make to put the industry on a firm footing must be decided.

It should be a helpful fact to those who are considering the problem that in this critical year the only beet sugar factory so far built in this country is going to make a profit for the first time.'

This is the factory at Cantley in Norfolk, mentioned above. The Manager explained that the chief reason why no profit had hitherto been shown was that the farmers had not supported the factory as they should have done, but that there was no doubt that, if the industry were backed up by the Government in such a way that the farmers would have confidence in its permanence and stability, an ample quantity of beets would be forthcoming.

sulting sods and mud into a bank or windrow along the middle of the road. It has long been my firm conviction that greater and more direct advantage would accrue to the people at large from the expenditure of \$1,000,000 on the public roads, under honest and expert engineering supervision, than from the expenditure of \$4,000,000 in railways. There are few subjects of more direct importance, from the point of view of the development of the natural resources of the country, than that of good roads, and it is one in furtherance of which the Commission of Conservation, aided by the Canadian Society of Civil Engineers might very appropriately do a little missionary work, in enlightening the community on its great importance, and inducing the Governments, Federal and Provincial, to take up this important matter. As a practical policy of far-sighted national wisdom, few courses of action would appeal with greater force to the more intelligent section of the electorate.

PEAT.

"Canada contains 30,000,000 acres of peat bogs, constituting immense potential wealth which, up to the present, has not, thus far been developed. Spasmodic efforts have been made to establish factories for the preparation of commercial peat fuel, but for various reasons—insufficient capital, high cost of labor, low cost of coal and others—the industry can not be said to have passed the preliminary stages nor to have gained a footing on a commercial basis.

"A dozen years ago a company was formed, and a plant was set up at Tusket, near Yarmouth, N.S., something over \$20,000 being spent on the installation. A few tons of excellent, partly carbonized, compressed peat fuel were turned out, but for reasons, that, though a small shareholder in the enterprise, I never discovered, it languished and finally died. A few bags of the output sent to me were used by Admiral Sir A. L. Douglas in his steam barge. He told me that it was admirable steam fuel, but that his engineer did not like it because it needed such a lot of shoveling into the fire box. I tried it in a grate at my house, and there it was simply an ideal fuel, giving a cheerful, hot, smokeless fire, with almost no ash. The manager of the concern claimed that the finished product could be turned out for about, or less than, \$2.50 per ton, and if this figure was correct, it makes the failure the more unaccountable.

"The Department of Mines, at its Fuel Testing Station at Ottawa, has, in the past few years, done much valuable experimental work, and issued numerous interesting bulletins, descriptive of exhaustive trials of peat as a fuel, but, in spite of the very favor-

able character of the results and reports of these trials, the manufacture seems to hang-fire as a commercial industry in Canada. Much more has been done in this line in the United States.

"Bulletin No. 154 of the Department of Mines 'Report on the Utilization of Peat Fuel for the Production of Power,' by B. F. Haanel, is an elaborate compilation, embodying the results of experiments conducted at the fuel-testing station. In the 'General Deductions and Conclusions,' the comparative power values of peat and coal are not specially emphasized but figures are given from which it would appear that, pound for pound, coal is slightly superior as a source of *producer-gas power*, though a little more expensive.

Calorific value of coal	12,500 B.T.U. per lb.
" " " dry peat	8,650 " " "
Fuel economy of producer-gas power plant	1.25-1.50 lbs. of coal per b.h.p.
Fuel economy of producer-gas power plant	1.78-2.04 lbs. of peat per b.h.p.
Fuel cost of peat in producer-gas power plant, with peat at \$2 per ton	\$8.70 per b.h.p.

"Hence, the superiority of peat over coal as a source of power in a producer-gas plant would depend upon its lower cost, which is the point at issue, and not the relative advantages of the ordinary steam plant and the producer-gas plant, as developers of power, the latter, as is well known, being a good deal superior to the former.

"The salient fact to which I wish to call attention is, that excellent peat fuel can be put on the market for \$2.00 to \$2.50 per ton, and that good business could be done by a company with sufficient courage and capital to take up the industry on an adequate scale.

"The chief obstacles in the way of the establishment of the industry appear to be, (a) the difficulty of adequately drying the peat before carbonization and compression. It has been almost conclusively shown that artificial drying is too expensive; and natural or air drying for a plant of any considerable size, requires an immense area of drying space and longer periods of warm, dry weather than are experienced in most parts of Canada. (b) Even with a factory on a large scale, the machinery would have to be more or less portable, because the peat bogs throughout the country are widely scattered and none of them are inexhaustible, or even approach our working coal fields, in available quantity. In addition, it must be considered that air-dried peat contains about 35 per

cent. of moisture, and in shipment freight rate is paid on this amount of water.

"But peat has other features of potential value. Experiments have shown that it will yield from 25 to 30 gallons of alcohol, and from 20 to 40 pounds of ammonia-sulphate per ton (present value of the latter \$78.00 per ton). Indeed, 40 gallons and 66 pounds, respectively, have been claimed as actual results. I have no information regarding the cost per gallon of distillation on which the possible utility of the substance naturally depends, and this is a matter in regard to which the Forest Products Laboratories might profitably do some very interesting and valuable experimenting.

"In Michigan, in 1900, a factory was opened for the manufacture of paper from peat. Whether it was a success or a failure, I do not know, but in view of the rapid depletion of our forests, now going on, immense public benefit will result from a demonstration that peat is capable of replacing pulp wood as a source of paper.

PREVENTION OF COAL WASTE.

"At our coal mines, from the Atlantic to the Pacific, the waste of coal, and so of potential power, is simply appalling, or would be so in a country less generously endowed by nature. Mr. W. J. Dick, Mining Engineer to the Commission of Conservation, states that, in Saskatchewan, Alberta and British Columbia, from 10% to 35% of the whole output of coal brought to the surface is waste slack. Some of it is burnt on the prairies, owing to the danger of spontaneous combustion, if it is left lying about the pit-head. In British Columbia much is thrown into the sea. There is no doubt but that the waste in Eastern Canada is correspondingly great, and some attempt to inculcate a little economy on the part of coal mine operators would be in the direct line of the efforts and functions of the Commission.

"Mr. Dick says, in his report to the Commission on 'Conservation of Coal in Canada,' 1914,—

" 'To encourage the utilization of low-grade coals, and in order also to prevent the waste of slack coal, investigations should be carried on by the Government to determine the suitability of these classes of coal for use in the gas-producer for generating power, and their adaptability for the manufacture of briquettes for domestic use.'

"There are several briquetting plants in Canada; at the Bankhead Mine in British Columbia, where the capacity is 500 tons per 24 hours, and the cost of production is \$3.10 per ton; at the Inverness Mine, C.B., capacity, 240 tons per day; at the McKay Mine,

C.B., with an equal capacity; and at the Colonial Mine, near Sydney Mines, C.B., with a capacity of 175 tons per day. The limiting output of these four plants therefore is only about 1,100 tons per day, say 350,000 tons per annum, which is a very small proportion of the total slack coal produced, the rest being for the most part sheer waste.

"In Germany the manufacture of briquettes is an industry on a different scale, amounting to over 20,000,000 tons per annum. Of this large output, however, some 77% is made from lignite, but, as there are immense deposits of lignite in Canada, the value of Germany's example is but enhanced.

"At most of our mines a more profitable mode of realizing the value of slack and lignites would probably be the development of power by producer-gas, for the generation and transmission of electricity. The economic advantages of a producer-gas power plant over the ordinary steam plant to-day needs no demonstration, and even at the pit-head, where coal is at its minimum cost, these advantages should be considered by our mine operators.

COAL TAR DERIVATIVES.

"It is a well-known fact that the ultimate derivatives from the destructive distillation of a ton of bituminous coal are worth many times the original ton of coal, but that it costs money and skill of a highly technical character to produce them. In recent years, Germany has led the world in industrial chemistry, not because she has had a monopoly, either in capital or scientific knowledge, but simply that she seized opportunities that were neglected by other countries, notably by England. To-day she enjoys practically a monopoly in synthetic dyes and many other chemical substances derived from coal.

"The partial paralysis of Germany's industrial activities, as the direct result of the war, places within the grasp of England, and the Empire at large, a unique opportunity—I might say the national duty—of capturing from our enemy much actual and potential wealth in trade, commerce and manufactures, and, in this national-duty campaign, Canada should actively participate.

"Mr. W. J. Dick, in his report to the Conservation Commission on 'Conservation of Coal in Canada, 1914,' says,—

" 'Canada and the United States are far behind Germany and other foreign countries in adopting the economies resulting from the coking of coal in *by-product* ovens. In

Germany, at the present time, little or no coke is made except in retort (by-product) ovens. When the economies which may be effected by the use of such ovens have been so clearly demonstrated, not only by plants which have been constructed in Europe, but also by plants in the United States and at Sydney and Sault Ste. Marie, in Canada, it seems difficult to understand why they are not more generally adopted in Western Canada. There are several reasons why they have not been introduced; first, the greater cost incurred in installing them, and second, the lack of markets for the resultant by-products.'

"Some of our collieries are equipped with coke ovens which produce coke for iron and steel making, but of these coking plants only some two or three are by-product ovens. At the others, where the ovens are of a bee-hive type, the products are almost wholly wasted. A by-product oven costs about \$10,000, a bee-hive oven about \$1,000, but it has been shown that the advantage of the by-product oven over the bee-hive is so marked that the saving in coal and by-products by its use amounts to about \$4,500 per annum, or for by-products alone about \$3,700 on the normal output of 6.3 tons per oven per day.

"In Cape Breton the collieries of the Dominion Coal Company have a total output of about 5,000,000 tons per annum. In connection therewith, the Dominion Iron and Steel Company have, at Sydney, a coking plant turning out nearly half a million tons of coke per annum, nearly all of which they use in iron and steel making. The resulting tar they sell at two or three cents per gallon to the Dominion Tar & Chemical Company, at whose neighboring works it is distilled for its primary products of light oils, creosote, carbolic acid and pitch.

"So far as I am aware, no attempt is made by this last-named company, nor by any other in Canada, to extract any of the more complex and valuable derivatives from tar distillation, and herein lie the roots of a potential industry of considerable value and importance. As against the practicability of its establishment in Canada, it cannot be urged, as it undoubtedly can be urged in the case of several other industries suggested in these notes, that it is hampered by the high cost of labor, for comparatively little manual labor would be employed. The necessary highly skilled labor of practical chemists would cost little more here than in other countries.

"In no part of the field of industrial chemistry, to which at this juncture we should lay siege, is the promise of reward greater than

in the direction of coal tar distillation. Following the primary derivatives therefrom, the benzene, naphthalene, anthracene and phenanthrene series, are a host of derivatives (Lunge, in 'Coal Tar and Ammonia' gives a list of 190 substances) some of them, of course, mere chemical curiosities, rare and unimportant, but many of great and increasing scientific and pharmaceutical value.

"As I shall not be able to attend the Annual Meeting of the Society, I suggest that, if the Conservation Committee is to be continued, its aims and endeavors be reduced to some sort of method and, to that end, each member be asked to submit a note or memorandum on some specific subject, to be allotted or selected, with special view to the locality, circumstances and special features of his own individual activities and duties."

Mr. James B. Hegan writes as follows:—

"I propose to confine my suggestions entirely to matters pertaining to Prince Edward Island and find the field rather limited, inasmuch as about all, if not all, of the land, both tillable and forest, is now privately owned, and, while there are considerable tracts of growing timber forest, very little, if any, practical attention has been given by its owners, or by the Provincial Government, to guarding against forest fires, or for its reforestation. To continue and ensure this needed and important supply for the future, both these matters are worthy of attention, and should be taken up and arranged for by the requisite information, assistance, etc., being furnished by the Dominion or Provincial Government.

"Benefit would possibly result to the fishing industry, one of the Province's most valuable assets, were changes made in the present system of wardenship, and in the carrying out and enforcing of the existing laws and regulations regarding pollution of the streams and rivers by deposits of sawdust, etc., the illegal taking of fish, in and out of season, and the provision of proper and efficient fishways. Efficient enforcement would require the appointment of a few permanent, reliable officers, who should be paid sufficient salaries to ensure the devotion of their whole time and attention to their duties. The latter might include, during the lobster fishing season, the collection of the spawn lobsters caught by the fishermen. The fishermen should be compensated at same rates as if delivered at a canning factory. The lobsters so had should be set free in the inland and protected bays, where the catching of lobsters should be prohibited. It is suggested that the using of such means for their propagation, in lieu of the existing lobster hatcheries, is worthy of consideration, and should be given a trial. Whether it is advisable to permit the use of

steam trawlers within the enclosed bays and the 'three-mile limit' might be also a matter for consideration for both the interests of this Province and the Maritime Provinces generally."

Major R. W. Leonard suggested the "Economic Aspect of the proposed Georgian Bay Canal and the enlargement of the Welland-St. Lawrence Ship Canals, compared with Rail Transportation from Georgian Bay to Montreal," as an appropriate subject for discussion, and was requested to contribute a memorandum on this very important subject.

Major Leonard also wrote that:—

"Mr. J. B. Challies' recommendation that a Central Bureau, or Ottawa Clearing House of general Engineering information be established, appeals to me as being eminently sensible, and if adopted, *might* result in very large economies in the way of making surveys of the same ground by different Departments, etc. In my opinion, however, these suggestions do not go far enough, as in the various departments in Ottawa there are employed many men of high technical attainments in various lines, whose abilities are neither known nor recognized outside their own departments.

"The services of these employees could in very many cases be very usefully employed by other Departments of the Government than the one in which they are retained, without increased remuneration, and with much credit to the individuals, who would be glad to be given the opportunity of demonstrating their usefulness, and thus obtaining recognition and promotion.

"This Central Bureau or Clearing House might consist of a Committee of one or two able men, with necessary clerks, and with authority to collect and give information regarding the technical qualifications of employees by the Government and the work which they are doing, in addition to the tabulation of the maps and the other information filed in the various departments.

"Such a Bureau, *if made use of*, might, I believe, result in a great saving of employment of outside technical men, *if such a saving were considered desirable* by the members of the Government."

Mr. P. M. Sauder writes:—

"I have nothing new to bring before the Committee, but would like to again refer to the matter that I brought up two years ago, namely, that the Society urge the Dominion Government to co-ordinate and extend its Hydrographic Surveys.

"I was glad to note that when the Committee took this matter up it was found that the Dominion Government is giving more

attention to this matter than is generally realized. It was also pointed out that there was need for a complete re-organization in regard to it, and that this work should be concentrated in some shape or form, and that preferably some Dominion organizations should undertake it.

"Our report was adopted at the Annual Meeting in January, 1913, and the following motion passed:—

" 'Whereas this Society is of the opinion that it would be to the general advantage of Canada if a comprehensive system of hydrographic surveys was organized and prosecuted by some central body, with a special reference to stream measurements. Be it resolved that the council of this Society be directed to initiate with the proper officers of the Dominion Government and the various provincial governments a proposal looking to the co-ordination of all stream measurement investigations which are now being carried on by the several Dominion and Provincial Government Departments in various regions of the country, with the ultimate object of consolidating and continuing such investigations under some central body.'

"At a later date, I noticed a report to the effect that the Commission of Conservation would compile a record of all the stream flow data available in Canada. As yet I have not heard of any such report being published, nor have I heard any further regarding the matter.

"This probably is not a good time to approach the Government with matters of this nature, but Council should give this matter serious attention and take it up energetically with the proper officials of the Dominion and Provincial Governments at the first opportunity.

"In this connection, I would like to point out that apparently there is much more hydrographic work being done in the irrigation districts of Western Canada than elsewhere in Canada, and this, I think, is largely due to the activities of the Western Canada Irrigation Association. This was one of the first matters considered by this Association and taken up by it with the Federal and Provincial Governments, with the result that hydrographic work has been given special attention in this area.

"I am glad to note that special surveys and investigations have recently been made on the Grand River in southwestern Ontario. Having lived on the banks of this stream for several years, I quite appreciate the importance of this work, but this is not the only stream requiring attention. It seems to me that stream-flow records should have been commenced on all rivers years ago, but, as they

have not, steps should be taken to start them at once on all the important streams where they are not already being taken.

"Possibly a co-ordination of all of the work cannot be effected at once, but the work might at least be extended and this Society is the proper body to bring such matters to the attention of the Governments.

"The average person does not realize the importance and value of stream-flow records and there are, therefore, very few to keep the Government's attention to these matters. True, a number of the officials fully appreciate their value and take every opportunity to emphasize their importance, but there is no better way of getting a Government to take action than to be approached by a representative body, such as the Canadian Society of Civil Engineers.

"Mr. J. B. Challies made a recommendation last year which appears to have escaped any attention, and yet it seems to me it is a matter that should concern members of this Society, particularly. I refer to his recommendation that an office should be created for the distribution of public documents issued by the different Departments of the Dominion Government, and of the several Provincial Governments. I hope that some Committee will be instructed to take this matter up with the proper officials of the Federal Government and strongly urge them to establish such an office and at the same time to ask the Government to compile as much of its data in convenient form for publication as possible. There are many highly qualified technical men in the employ of the Government, and many of these could prepare very valuable bulletins on special investigations, which would be very valuable to the public, and particularly, Civil Engineers."

Mr. Sauder also wrote:—"I enclose herewith the bulletin of the 21st. International Irrigation Congress, at Calgary, in October last, and would particularly direct attention to the following resolution: 'We urge upon the federal governments the necessity for more liberal appropriations for the work of topographic survey in hydrographic stream gauging work; and we urge stronger co-operation by the several states and provinces in making appropriations for this important work.'

"Even though the United States Geological Survey has collected and is collecting a lot of stream flow records, and the Irrigation and Water Powers Branches of the Department of the Interior of Canada are also doing a lot of work in the irrigation districts of Western Canada, the International Irrigation Congress does not propose to let the different Governments forget the importance of this work. It is the Engineering Branch of irrigation

work that particularly requires this data, and I therefore cannot help but think that the Canadian Society of Civil Engineers should also take some action in the matter."

Mr. J. B. Challies, Superintendent, Water Powers Branch, Department of Interior, has sent the following:—

"With respect to the question of the deliberations of the Conservation Committee of the Canadian Society of Civil Engineers for which you ask me to submit suggestions, in my humble opinion this Committee would accomplish more if it confined its attention to matters of immediate professional importance and reasonably possible of solution, through or largely by the action of the members of the Canadian Society of Civil Engineers.

"Abstract questions, such as Indian Welfare, Lobster Conservation, Improved English, etc., are admittedly sufficiently important to occupy the thought and attention of any one interested in Canadian welfare, but surely the urgent necessity of having some central governmental information bureau as a clearing house for all survey and general engineering information gathered by the various Departments of the Government, and the advisability of having some uniform method of publication of such information, especially hydraulic or hydrographic data, including stream flow, offers some tangible possibility of realization, and because of pressing and immediate value, deserves the serious and active attention of our Conservation Committee.

"If it is the question of a general information bureau for the purpose of securing, collating and making available the tremendous amount of extremely valuable engineering data gathered by the various Government Departments at Ottawa, and of the advisability of having our hydraulic and hydrographic data made available by the different Dominion and Provincial organizations in a systematic and regular manner, I can only reiterate the opinions offered in my letter to you of December 31st, 1913,* in this same connection.

"May I suggest that a special effort be made to have as many members as possible of the Conservation Committee meet at the forthcoming Annual Convention of the Society, for the purpose of having a thorough discussion of the various matters that have been brought to the attention of the Committee by its membership?"

Prof. R. O. Swezey sent the following communication:—

"This year I shall deal very briefly with one or two phases of conservation under the headings of "Indians and Forestry."

* Published in Report of the Committee for 1913. In it Mr. Challies urged the establishment of a Central Bureau to which enquiries respecting results of surveys, investigations, etc., by the Dominion Government could be addressed. He also advocated the segregation of the basin of the Lake of the Woods in Canada as a forest reserve and suggested the advisability of recommending some systematic method of making results of the various hydrographic surveys available to the public quickly and uniformly.

But before taking up these questions permit me to comment on some of last year's suggestions by other members of the Committee.

"Mr. J. B. Challies' recommendation for the establishment of a central information bureau at Ottawa, where the ordinary individual, not versed in the intricacies of tangled red tape, can obtain maps, reports and public documents, is an exceedingly good one, which, were it adopted, would supply a long-felt want, enabling a busy man to obtain the data desired and return to his business unruffled by the exasperating delays which the present jumbled system forces upon him.

"Mr. C. E. Dodwell's contribution of last year on Forestry and the Utilization of Forest Products touches on a very important question, and is especially interesting since he independently reached conclusions on a subject that was then engaging the attention of the Forestry Branch of the Department of the Interior. It will be of interest, therefore, to Mr. Dodwell and other engineers to know something of the progress made in the establishment of the Forest Products Laboratories at McGill University by the Dominion Government.

"This country is rapidly forging ahead to the position of the greatest paper manufacturing country in the world, so that in that alone the efforts are amply justified. These laboratories are under the control of the Director of Forestry, Mr. R. H. Campbell, and Mr. John S. Bates is the Superintendent directly in charge. In order to keep in close touch with the commercial and industrial requirements, an advisory Board of three outside men has been appointed and consists of Mr. Carl Riordon, Mr. J. A. De Cew and Mr. R. O. Sweezy.

"I am indebted to Mr. Bates for a brief summary of the progress made and objects aimed at. This summary is attached to my communication.

"Returning now to the subjects already referred to:—

"(1) *Indians*.—I have pleasure in stating that my appeal of last year on behalf of the Ojibway Indians of Quebec and Ontario met with prompt and sympathetic response from the Federal Government. During the past summer, I have found conditions greatly improved by reason of the presence of medical men employed by the government to succor the afflicted and institute other measures of relief. It is expected that a larger and improved system will evolve from the beginning already made.

"(2) *Forests*.—Some five or six years ago the Conservation cry was first heard in Canada, particular stress being laid on the

perilous conditions threatening the extinction of our forests. That cry has been so persistently maintained by the Canadian Forestry Association and the Press that the effect is now showing in a very gratifying manner.

"Before all this alluring talk of Conservation was heard the forest trails and routes presented deplorable signs of thoughtless negligence in the numerous unextinguished camp fires usually found in the wake of "tenderfoot" and "bushwhacker" alike. That the well organized campaign to educate the erring public in this regard has been successful is well shown now by the fact that to-day it is only on very rare occasions that a smouldering and abandoned camp fire is found, because all woodsmen and sportsmen have been made to think by the teachings of Conservationists, so that they exhibit care when handling fire. But it requires constant effort and repeated warnings to maintain that attitude, else relaxation will permit a return to carelessness and destruction.

"Having expressed appreciation of the progress made, let us now face the evils that remain, which are:—

1. The railway contractor.
2. The railway operator.
3. The settler.

"Railway builders (contractors and others) with characteristic arrogance are perhaps the most provoking of all the destructive agents that hound the forest. Wherever the railway contractor has been millions of acres of virgin forest have been swept by fire, and his ignorant unconcern is only equalled by his carelessness in starting the fire. All that he is concerned about is "cut" and "fill."

"The thousands of foreigners employed on all railway construction, particularly in the timbered hinterland, know the dangers of forest fires, and in their native land would exercise the greatest care. Transported to Canada, they appear to be under the impression, either that there are no laws protecting the forest, or that they are a dead letter. We spend our money and energy educating native Canadians against this evil, but till recently have dumped foreign legions into the forest without controlling their destructive habits of scattering camp fires and smudges everywhere, leaving them to transform the country into miles of desolation.

"The railway operator has, of late years, been compelled to provide mechanical means to protect forests against sparks of locomotives, and the burning of debris along the right-of-way is now largely carried on during the wet periods, though, in remote parts where public opinion is not likely to be aroused, it

is difficult to rigidly supervise the ignorant section-men, who are necessarily entrusted with this work.

"The settler must be educated and compelled to stop burning the forest. There are laws governing his mode of burning slash, but it is difficult to enforce them unless the Governments interested are prepared to pay the cost of efficient protection.

"The conquest of these three destructive enemies of the forest offers no great difficulty if proper measures are taken. And there is enough machinery already, so that we can reasonably expect prompt action if we can start. Unfortunately, officialdom, not seeing with its own eyes, must be spoon-fed to these statements, and meantime the destruction proceeds."

PROGRESS OF WORK IN FOREST PRODUCTS LABORATORIES.

The Forest Products Laboratories of Canada were established in 1913 under the jurisdiction of the Forestry Branch of the Department of the Interior. As generous offers of co-operation were extended by McGill University, the laboratories have been placed in Montreal, with headquarters on the University campus. Temporary accommodation has been provided pending the construction of a new building. The present building provides general offices, chemical laboratory, photographic room, etc., and an adjoining building is being reconstructed to serve as an experimental paper mill. The University testing laboratory has been placed at the disposal of the laboratories for the work in timber testing. A small sawmill has been constructed on the outskirts of the city for handling wood specimens to be tested in the laboratory. A wood-working shop and machine shop are also available.

Work in the laboratories will be largely devoted to experimental research on wood and the many products which can be manufactured therefrom. Investigations are also being undertaken with a view to extending the knowledge of wood itself, to indicating improved methods for utilizing the raw material furnished by the Canadian forests, and to find ways and means of utilizing the enormous amount of wood which is wasted in the lumber and allied industries.

For the Division of Timber Tests an impact testing machine and a 30,000 lbs. Olsen Universal testing machine have been installed in the McGill University testing laboratory. The additional equipment owned by the University, including a 200,000 lbs. Wicksteed testing machine, a 150,000 lbs. Emery testing machine and a 60,000 lbs. Reihle testing machine have also been placed at the disposal of the laboratories. A comprehensive series of tests

of the "Mechanical and Physical Properties of Canadian Woods, as Determined by Tests on Small, Clear Specimens," has been undertaken and has been in progress for several months past on representative specimens of Douglas fir from British Columbia and Alberta. Later, other species will be tested that the absolute and comparative strengths of Canadian woods will be established for the benefit of the wood-using industries. A second project, to be undertaken in the near future, is the testing of Douglas fir and other species in structural sizes. A third investigation now in progress consists of the testing of commercial pit props and booms, used in large quantities by the mining industries of Canada, and available in immense quantities for export. This represents one phase of the comprehensive investigation of mine timbers being carried on.

The present equipment in the Division of Timber Physics includes apparatus necessary for the study of moisture content, specific gravity, fibre characteristics, and other physical properties of wood. At present, the work is limited to determination of the physical nature of the specimens examined by the Division of Timber Tests. It is hoped to extend the work to include wood seasoning and the many important branches of wood technology.

A separate building is being equipped to permit the carrying on of pulp and paper-making processes on a semi-commercial scale. The equipment will include a paper machine, beaters, and such other apparatus as is necessary to conduct investigations in a thoroughly practical manner.

The Division of Wood Preservation will carry on field tests which should prove of great value. Studies will be made of methods of treating railway ties, telephone poles, mine timbers, etc., and records will be kept of the life of treated and untreated timbers under varying conditions. To this end the co-operation of the railroads and other industries is being solicited.

A number of other Divisions in the field of forest products will be commenced when conditions make such development possible. For the present, a certain amount of work will be undertaken in the chemical study of wood and its products, and the co-operation of our Canadian universities in this work has been solicited. A general study of wood distillation is also being made, and the laboratories were represented at the commercial distillation tests on British Columbia Western yellow pine conducted in North Carolina in August last.

A complete series of wood specimens from all parts of Canada will be collected for exhibition in the Laboratories. A considerable number of specimens are already on hand, and specimens of manu-

factured wood articles, pulp and paper, wood flour, composition boards, artificial silk and the many other products which can be made from wood will be collected for exhibition purposes. In this way a valuable museum of forest products will be available to stimulate the public in conserving our great natural resources.

Col. Thos. H. Tracy writes as follows:—

"Yours of Aug. 22nd and of Nov. 25th received. So far as my observation goes the principal waste to note in British Columbia is in the sawmills. The sawdust is usually burned under the boilers, the slabs and blocks sold for firewood, but all the trimmings are usually burned in expensively constructed burners (some of them costing as high as \$50,000). For every 3,000 feet B.M. of lumber produced, I am informed that two loads of wood, equal to nearly 2,000 feet B.M., are wasted.

"The labors of the Forest Products Laboratories may show a way to utilize the waste, but in addition the staff could probably collect information as to any successful methods in use in other places, and all this information should be supplied to the mill-owners, who would be glad to adopt any suitable means of more thoroughly utilizing the products of their mills.

"The British Columbia Government have a forestry department to look after the protection of the forests and reforestation. The Government also has a good Water Department, which is carefully looking after the question of water supply and power."

MEMBERS OF COMMITTEE

C. R. Coutlee,	A. E. Doucet,
H. F. Laurence,	R. S. Lea,
R. McColl,	R. W. Leonard,
R. O. Sweezey,	E. E. Brydone-Jack,
W. H. Breithaupt,	W. R. W. Parsons,
G. A. Bayne,	John Chalmers,
A. J. McPherson,	T. H. Tracy,
J. S. Dennis,	J. B. Challies,
J. B. Hegan,	C. H. Mitchell,
C. E. W. Dodwell,	Wm. McNab.

James White, Chairman.

Mr. White also presented and read a statement from Major R. W. Leonard on the economic situation in regard to the Welland-St. Lawrence Canal and the proposed Georgian Canal.

Mr. White stated that the publication on Canadian Altitudes referred to in the report of the Committee would shortly be ready for distribution. It was proposed to limit the circulation of this work as far as possible to Engineers. He had adopted as datum for the Eastern portion of the Continent the mean sea level as determined at Halifax, and for Ontario and the prairie provinces the New York datum as connected with Rouse's Point was referred to. It was thought that the elevations given would everywhere be reliable within about two feet. Answering a question as to the possibility of establishing a common datum plain for the Continent, Mr. White remarked that this was entirely a matter of co-operation between the several departments on the one hand and the Dominion of Canada and the United States on the other. Col. Anderson remarked that the several excellent determinations of mean sea level made under the direction of the Department of Naval Affairs should be referred to and made available in connection with a Continental system of elevations.

On motion by Mr. White, seconded by Col. Anderson, the report of the Conservation Committee was adopted.

COMMITTEE OF THE ELECTRO TECHNICAL COMMISSION.

The following report of the Committee of the Electro Technical Commission was presented by Prof. L. A. Herdt:—

This Committee begs to report that during the early part of the year 1914 the Commission has been largely engaged in collating the various matters which rose out of the 1913 Berlin Congress, and in getting the different subjects assigned to the Sub-Committees in shape for the Committee meetings.

Publications on the following matters have been issued:—

International Symbols—Pub. No. 27.

International Copper Standards—Pub. No. 28.

Nomenclature of Hydraulic Turbines—Pub. No. 29.

Report of Berlin Meeting—Pub. No. 30.

The most important of these is, of course, that on Copper, which marks an epoch in international standardization.

During the latter part of the year the war conditions have, of course, greatly disrupted the International Commission and hampered the work; in fact, at one time it seemed as if the projected 1915 San Francisco Congress would have to be abandoned. Lately matters have improved, and it now appears as if this Congress will take place and the Programme drawn up carried out with but little modification. The General Secretary, Mr. C. Le Maistre, had, however, to cancel a proposed trip to Canada and the States

mentioned in the previous report to the Society, much to the regret of the United States and Canadian Committees.

The Officers and Members of the Canadian Committee remain as at last year, namely:—

L. A. Herdt, Montreal, Chairman.
O. Higman, Ottawa, Vice-Chairman.
H. T. Barnes, Montreal.
W. A. Duff, Winnipeg.
L. W. Gill, Kingston.
J. Kynoch, Toronto.
J. Murphy, Ottawa.
T. R. Rosebrugh, Toronto.
A. B. Lambe, Ottawa, Secretary-Treasurer.

L. A. HERDT,
Chairman.

Ottawa, Jan. 12th, 1915.

On motion by Prof. L. A. Herdt, seconded by Mr. J. A. Duchastel, the report was adopted and the Committee continued.

REPORT OF COMMITTEE ON SPECIFICATIONS FOR CAST-IRON AND STEEL WATER PIPES.

COMMITTEE ON CAST-IRON AND STEEL WATER PIPES.

Members of Committee—F. H. Pitcher, Chairman; T. C. Irving, Jr., N. J. Ker, A. Currie, C. H. Mitchell, F. X. A. Leofred, C. L. Fellowes.

The report of the Committee on Cast-Iron and Steel Water-pipes was presented by Mr. F. H. Pitcher:—

Your Committee has carefully considered whether or not in view of the best practice in the manufacture of Cast-Iron Water Pipes any revision of the Society's Specifications is desirable, and has come to the conclusion that the Specifications for Cast-Iron Pipe, as at present sanctioned by the Society, meet every requirement.

In regard to the matter of Steel Pipes for Waterworks purposes, it is the opinion of the Committee that the time has not yet arrived for Standard Specifications to be made by the Society. Hundreds of miles of steel water main, both for force mains, principal feeders, distribution pipe, etc., are in successful operation

in this country and elsewhere; but there is not, in the opinion of this Committee, sufficient unanimity among Engineers and the different manufacturers as to Standard practice to establish the drawing up of Specifications which this Society could be recommended to sanction.

The matter is, however, rapidly assuming greater importance and there are signs that Standardization may be possible in the near future.

It would, therefore, seem desirable that the Society should have a Committee on this matter which would keep in touch with the development, and when possible submit Specifications for approval.

Respectfully submitted,

F. H. PITCHER,
Chairman.

On motion by Mr. Pitcher, seconded by Mr. H. M. MacKay, the report was adopted and the Committee continued.

AWARD OF GZOWSKI MEDAL.

The Secretary read the following communication from the Council of the Society: The Council as the result of the report of the Gzowski Medal Committee recommends that the award for the best paper of the year be made to Mr. P. A. N. Seurot, M.Can. Soc.C.E., for his paper on "Sub-aqueous Tunnelling." On the motion of Col. Anderson, seconded by Mr. Doucet, the report was unanimously adopted.

The Secretary also read the report of the Gzowski Medal Committee as to the award of Students' prizes.

On resolution it was resolved that prizes should be given as follows:—

D. Bremner, S.Can.Soc.C.E., for his paper on "The Cost of Modern Houses."

E. E. Watts, Jr.Can.Soc.C.E., for his paper on "An Investigation upon the Treatment of Canadian Zinc Ore."

L. A. Badgley, Jr.Can.Soc.C.E., for his paper on "A Plane Table Survey for Town Planning."

C. A. Macaulay, S.Can.Soc.C.E., for his paper on "The Evolution of Stopping Methods during the last Decade."

The Meeting then adjourned for luncheon.

At 1.30 p.m. a complimentary luncheon by the Residential members to the Visiting members was given in the Rose Room of the Windsor Hotel, and was attended by some 200 members.

AFTERNOON SESSION, JANUARY 26TH, 1915.

The Meeting re-assembled at 3 p.m., the President, Mr. M. J. Butler, C.M.G., in the Chair.

The reports of Committees were continued.

COMMITTEE ON REINFORCED CONCRETE.

Mr. Francis in presenting the report stated that copies of it were now in the hands of the membership. A general discussion of the report took place, and the Chairman of the Committee read a special communication in regard to it from Mr. J. A. Dillabough. The discussion and correspondence in regard to the report were referred to the Committee. On motion by Mr. Francis, seconded by Mr. Bruner, the report was adopted and the Committee continued.*

JUNIOR SECTION.

Mr. A. J. Kelly, as Chairman of the Junior Section, presented the following report on behalf of the Section:—

176 Mansfield Street, Montreal,
January 22nd, 1915.

Committee of the Junior Section—J. H. Norris, R. M. Walker, W. Clerk, B. O. Smith and A. J. Kelly.

The Section held four meetings during the past year and the following papers were read:—

February 26th—"Contracts and Costs of Brick Veneer Building Construction," by Mr. J. H. Norris.

March 17th—"Movable Bridges," by Mr. J. Robertson.

October 27th—"The Moose Jaw Water Supply System," by Mr. R. M. Walker.

December 1st—"The Substructure of the Fraser River Bridge at Fort George," by Mr. H. L. Bodwell.

Respectfully submitted,

BRITON O. SMITH,
Secretary.

ALBERT J. KELLY,
Chairman.

On motion the report was adopted.

* NOTE.—This report having been adopted as a standard specification will be printed for distribution as required.

Mr M. J. Butler, C.M.G., delivered the following address as the retiring President:—

PRESIDENT'S ADDRESS.

Each succeeding President finds it more difficult to decide upon a subject for the Annual Address. Generally, my predecessors in the Chair have found a technical subject, more or less allied to the work in which he had been engaged.

On this occasion, I venture to depart from the usual course. We meet under unusual world-wide depression of business conditions; our Empire is at war, not of our seeking, but forced upon us, for the preservation of good faith, and in pursuance of treaty obligations, by one of the signatories to the Treaty. It is worth while to know that we are part and parcel of an Empire which regards treaty obligations as something more than a "scrap of paper."

The European war has upset all the business affairs of the world, and marks a stop in the progress of Canada. It seems to me that we may profitably consider where we are at, and what we may look forward to.

I propose, as briefly as possible, to review our progress for the past decade, in transportation, trade, population, with such comments as may elucidate probable future developments.

In 1904 we had 19,431 Miles of Railway in Operation.

In 1913 we had 29,304 Miles of Railway in Operation.

The railway statistics of Canada prior to 1907 failed to supply any detailed information, hence for the purposes of comparison I shall confine myself to the period from 1907 to 1913.

Miles of Track in 1907	=	27,967.
Miles of Track in 1913	=	38,223.
Miles of Railway in 1907	=	22,452.
Miles of Railway in 1913	=	29,304.
Tons Hauled One Mile in 1907	=	11,687,711,830.
Tons Hauled One Mile in 1913	=	23,032,951,596.
Tons Hauled per Mile of Line, 1907	=	518,486.
Tons Hauled per Mile of Line, 1913	=	785,820.
Freight Train Mileage, 1907	=	38,923,890.
Freight Train Mileage, 1913	=	67,320,090.
Average Tons per Train, 1907	=	260.
Average Tons per Train, 1913	=	342.
Average Tons per Car, 1907	=	15.37.
Average Tons per Car, 1913	=	19.01.
Average Receipt Per Ton Mile, 1907	=	0.815c.

Average Receipt Per Ton Mile, 1913	=	0.758c.
Revenue from Freight, 1907	=	\$94,995,087.
Revenue from Freight, 1913	=	\$174,684,640.
Gross Earnings per Mile, 1907	=	\$6,535.63.
Gross Earnings per Mile, 1913	=	\$8,750.50.
Earnings per Train Mile, 1907	=	\$1.953.
Earnings per Train Mile, 1913	=	\$2.264.
Expenses per Train Mile, 1900	=	\$0.864.
Expenses per Train Mile, 1904	=	\$1.216.
Expenses per Train Mile, 1907	=	\$1.381.
Expenses per Train Mile, 1913	=	\$1.604.

It will be observed that the cost of running trains per mile since 1904 has increased 31%, and that in the past 13 years the increase has been 85%. The percentages for the period from 1899 to 1913 were for earnings, an increase of 89.8%, and for expenses 105.9%.

In 1907, 124,012 men were in the employ of the railways, earning \$58,719,493, or 56.7% of the operating cost.

In 1913, 178,652 men earning \$115,749,825, making 63.59% of the operating expenses.

Nominally, there are 193 railways in Canada. Actually, they may be considered as being comprised into a few great systems in order of magnitude: The Canadian Pacific, the Grand Trunk and Grand Trunk Pacific, the Canadian Northern, the Government Railway, the Great Northern, and one Province-owned, the Temiskaming and Northern Ontario. The Algoma Central and the Sydney and Louisburg owing to being allied with great industrial undertakings may remain independent. All of the remaining lines are in due course to be absorbed by these great corporations.

It is proper to remark that we in Canada have the greatest railway mileage per head of population of any country in the world, with three Transcontinental Railways with terminals at tide water on the Atlantic and Pacific. As might have been expected, the Engineering profession has profited by such an extensive railway building programme. It is now at an end, and the conditions for the employment of Engineers are bad; hence, as intelligent men, some other field of occupation must be sought. A close study of the statistics discloses that good service is rendered at reasonable cost. The traffic density is increasing and hence the railways may look forward to prosperity as soon as business resumes its normal condition. Fundamentally, Canada is an agricultural country, with resources in mines, forests, and manufacturing, and the inter-

relationship of all kinds of employment is essential to the well-being of the country. Not every man is suited to a farmer's life. Sons and daughters seek the work they are naturally adapted to, hence sectional appeals to the Government should be frowned upon, and such action taken by wise adjustments of the tariff as will insure to us a well rounded life work. Nevertheless, the greatest problem before the country is the transportation question. So far as I am aware of, Canada is unique in this regard. It is the only country I know of where, politically and otherwise, we must, to preserve our independent action, fight against geography. It is well known to all of you as a physical law, that forces all tend to move along the lines of least resistance. We have, as a nation, undertaken the task of forcing our outlets against the lines of least resistance. The Atlantic seaboard is the outlet for the products of the prairies situated some 1,500 miles inland, and our efforts in building railways with easy curves and grades, the enlargement of our canal system, the improvement of rivers, and particularly of the St. Lawrence route, have but the one object, to put a few cents more per bushel into the pockets of our farmers. The enlargement of the Welland Canal will allow the larger type of ship of 300,000 bushels capacity to pass down Lake Ontario and the River St. Lawrence to within 120 miles of Montreal. Great storage elevators will be erected at or near Prescott, and 1,000-ton barges will be towed through the present canal system to Montreal. Each incoming ship is known for days ahead, and the exact cargo of grain required can be in waiting for transfer by floating elevators. Ultimately, however, the larger ship will come through to Montreal, as it is quite practicable and within the resource of the country to convert the St. Lawrence River into slack water navigation, by the building of eight dams, with duplicate locks, and as an incident thereof, develop the greatest water powers in the world, aggregating over 4,000,000 h.p., eliminate the ice jams, and make practicable the navigation of the river in winter by the aid of powerful ice breakers.

It is a duty our Government may well undertake at the earliest possible moment, to secure a hydrographic and topographic survey of the St. Lawrence, so that accurate estimates of cost may be made, and that proper regulations may be drawn to so regulate proposed power developments owned by private corporations, that each may be brought into a component part of the completed whole.

It would be difficult to place a limit on the possibilities of such a power development situated on the greatest transportation route in the world. Cheap and abundant power means so much to a country.

TRADE:—Our trade has grown by leaps and bounds during the period under review.

EXPORTS TO—

Year.	United Kingdom	United States	Other Countries	Total
1900	\$96,562,875	\$52,534,977	\$14,412,938	\$163,510,790
1914	\$215,253,954	\$163,372,690	\$52,961,795	\$431,588,439

IMPORTS FROM—

Year.	United Kingdom	United States	Other Countries	Total
1900	\$44,279,983	\$102,080,177	\$26,146,718	\$172,506,787
1914	\$131,942,249	\$395,565,328	\$90,821,277	\$618,328,874

The feature which concerns us closely is the growth of manufacturing and the development of mining products:—

STATISTICS OF MANUFACTURES, 1900 TO 1910—

	1900	1910	Increase %
Establishments	14,650	19,218	31.18
Capital	\$446,916,487	\$1,247,583,609	179.15
Employees on Salaries	30,691	44,077	43.61
Salaries	\$23,676,146	\$43,779,715	84.91
Employees on Wages	308,482	471,126	52.72
Wages	\$89,573,204	\$197,228,801	120.19
Raw and Partly Manufactured Materials	\$266,527,858	\$601,509,018	125.68
Products	\$481,053,375	\$1,165,975,639	142.38

MINERAL PRODUCTION—

	1900	1910	Increase %
Mines and Works	1,373	2,222	61.84
Value of Buildings and Plant	\$42,771,803	\$108,506,051	153.68
Employees on Salaries	1,527	2,884	89.86
Salaries	\$1,512,821	\$3,317,030	119.26
Employees on Wages	37,065	67,150	81.16
Wages Paid	\$16,336,273	\$39,129,941	139.53
Value of Products	\$47,956,862	\$122,004,932	154.40

A marked feature of our trade is the importation of steel products and manufactures of which steel is the important constituent. For the year 1911 we brought in \$85,319,541, of which \$11,448,428 were on the free list. We also imported fire clay and fire brick to the value of \$994,193, all of which was on the free list. I have no desire to infringe upon the boundary line of politics, but may be permitted to point out that such a tremendous balance of trade against us is one that thoughtful men may well ask, how is it to be dealt with? I venture to say that by careful re-adjustments of the tariff quite 50% of the importations may be profitably carried on in Canada. We have been large borrowers in the world's markets, spending money lavishly, and on the whole, wisely; here and there over-capitalized, ill-considered industrials will be found, but the time has arrived when we must economize, pay our way, write down inflated capital, and show the loaning world Canada is solvent, and worthy of the trust and confidence shown us. I have no doubt of the ultimate result. Our resources of unworked land, our mines, forests and fisheries will afford homes and opportunities for millions of men. In 1901 our population was 5,371,315, of which 3,349,516 were rural and 2,021,799 were urban; in 1911 our population was 7,206,643, of which 3,925,679 were rural and 3,280,964 were urban. It will be noted that barely 600,000 additional was made to the rural population, whereas the great increase flocked to the cities, towns, etc. This is not satisfactory, and efforts will be needed to bring more people to the land.

In concluding his address, Mr. Butler referred to the death during his term of office of two past presidents of the Society, Mr. T. C. Keefer, C.M.G., and Dr. J. Galbraith. Mr. Keefer, the first President of the Society, was a great man and a great Engineer. Dr. Galbraith was a man who had endeared himself to a large number of members of the Society. His work was well done and would live after him.

Mr. John Kennedy expressed his personal gratitude for the valuable records that the President had compiled, and moved that the thanks of the Society be tendered to him for them. This motion was seconded by Col. Anderson, and being put to the Meeting by the Secretary was carried unanimously.

The President requested the Meeting to name a member who would frame a cablegram in reply to that received from Col. Mitchell which had been read at the opening of the morning session. Mr. Oliver suggested that the message should include those other members of the Society who were in England, preparing to go to France in defence of their Country. Mr. Francis suggested

that a message should also be sent to those members of the Society who were serving with the French Army. These proposals were unanimously agreed to and Messrs. Francis and Oliver were named to draft the messages.

The meeting was then adjourned to January 27th, at 3 o'clock.

TUESDAY EVENING, JANUARY 26TH, 1915.

A Smoker was held in the Society's Rooms under the direction of a Committee of local members. During the evening Mr. H. T. V. Meurling gave an interesting address on "Submarine Mining Methods in Warfare."

WEDNESDAY MORNING, JANUARY 27TH, 1915.

On the invitation of the Cedars Rapids Manufacturing and Power Company, a party of 50 members visited the works of the Company at Cedars. The Grand Trunk Railway Company placed a special train at the disposal of the party to convey them to and from Cedars Station. Sleighs were provided by the Cedars Rapids Company to carry the members to the works. The Contractors, Messrs. Fraser, Bryce and Company, entertained the party at luncheon in the Power House. Another and larger party of the Society visited the Angus shops, to which they were conveyed by special train provided by the Canadian Pacific Railway Company.

WEDNESDAY AFTERNOON, JANUARY 27TH, 1915.

The meeting was called to order at 3 p.m., the President, Mr. Butler, in the chair.

The reports of Committees were continued.

GENERAL CLAUSES FOR SPECIFICATIONS.*

Mr. H. Holgate presented the report of the Committee on General Clauses for Specifications. The report, which had already been distributed to the membership, was taken as read. Mr. Holgate stated that the specification clauses presented were in the nature of a progress report, and had been placed before the members for discussion and their recommendation. At the request of Mr. Holgate, Mr. H. R. Safford read a letter in discussion of the report. Mr. G. H. Duggan followed in criticism of several of the suggestions of the Committee, and a discussion was taken part in generally by the members present. On motion by Mr. D. Macpherson, seconded by Mr. S. B. Clement, the Committee was re-appointed and the report referred back to it. The Committee was empowered to add Mr. G. H. Duggan and Mr. H. R. Safford to its membership.

* NOTE.—This report having already been distributed is not reproduced here.

On the suggestion of Mr. John Kennedy the Committee was authorized to employ a Solicitor to assist in the work.

The Committee as reconstituted is as follows:—

Mr. H. Holgate, Chairman,	Mr. J. G. G. Kerry,
“ E. G. M. Cape,	“ G. H. Duggan,
“ R. de L. French,	“ H. R. Safford.
“ W. Chipman,	

COMMITTEE ON RAILS.

The President, Mr. M. J. Butler, presented the report of this Committee.

MEMBERS OF THE COMMITTEE:

M. J. Butler,	G. A. Mountain,
J. M. R. Fairbairn,	A. F. Stewart,
H. G. Kelley, Chairman.	

The Rail Committee begs to report as follows:—

In recent years a great deal of work has been done toward the improvement and standardization of rail specifications, both individually and through the American Railway Engineering Association, which has a committee at work composed of a number of the best known Engineers in America, under whose supervision a specially qualified Engineer and Metallurgist has been employed to devote his whole time to the compilation of data, both from actual results obtained through reports from the various railways and from tests of various kinds which he has made with the co-operation of the manufacturers.

Marked advances have been made in the rail specifications as now adopted by the American Railway Engineering Association, these covering both chemistry and mill practice, and your Committee feel that they cannot do better at the present time than recommend the adoption by the Canadian Society of Civil Engineers of the so-called “A.R.E.A.” rail specification, a copy of which is attached hereto.

Yours truly,

HOWARD G. KELLEY, Chairman.

On motion by Mr. G. A. Mountain, seconded by Mr. T. A. Tomlinson, the report of the Committee was adopted and the standard specification of the American Railway Engineering Association approved as the standard specification of this Society.*

*NOTE.—The A.R.E.A. specification for Carbon Steel Rails, having been distributed to the membership with the Reports of Committees, is not reproduced here.

COMMITTEE ON TRACK.

Mr. H. R. Safford presented the report of the Committee on Track, and outlined the proposals of the Committee as regards future work, in accordance with the report already in the hands of the membership. Mr. Safford moved, seconded by Mr. D. MacPherson, that the report be approved and the Committee continued. Motion adopted.

The meeting was then adjourned to Thursday, January 28th, at 10 o'clock.

WEDNESDAY EVENING, JANUARY 27TH.

The Members' Dinner was held at the Engineers' Club. The President, Mr. Butler, occupied the chair.

The chief guest of the evening was the Hon. Sir Geo. E. Foster, K.C.M.G. There was a large attendance.

THURSDAY MORNING, JANUARY 28TH.

The meeting was called to order at 10 a.m. Mr. Butler in the Chair.

The President asked for nominations for membership of the Committee charged with the nomination of Officers and Members of the Council for the year 1916. The Secretary read the following nominations:—

By the Council of the Society for District No. 1—Messrs. C. M. Monsarrat and J. C. Smith.

By the Members of Council residing in the Maritime Provinces—Messrs. W. A. Hendry and C. W. Archibald.

By the Quebec Branch for District No. 3—Mr. S. S. Oliver.

By the Ottawa and Kingston Branches for District No. 4—Mr. L. W. Gill.

By the Toronto Branch for District No. 5—Mr. E. W. Oliver.

By the Edmonton, Calgary and Winnipeg Branches for District No. 6—Messrs. J. S. Dennis and H. N. Ruttan.

By the Victoria and Vancouver Branches for District No. 7—Mr. R. W. Macintyre.

There were no nominations by the members present at the meeting. A ballot was ordered and Mr. Wm. McNab and Mr. A. St. Laurent were appointed scrutineers.

As the result of the ballot, the President declared the following elected members of the Nominating Committee:—

For District No. 1.....	Mr. C. N. Monsarrat
For District No. 2.....	Mr. W. A. Hendry
For District No. 3.....	Mr. S. S. Oliver
For District No. 4.....	Mr. L. W. Gill
For District No. 5.....	Mr. E. W. Oliver
For District No. 6.....	Mr. H. N. Ruttan
For District No. 7.....	Mr. R. W. Macintyre.

Prof. H. E. T. Haultain referred to the important announcement which had been made by the President at the dinner on the previous evening, namely, the institution of two medals for original work, one in the Department of Mining by Major Leonard, and one in Metallurgy or Chemistry by Mr. J. H. Plummer, D.C.L. These medals would, in his opinion, prove of enormous advantage to the profession, and he hoped that a larger number of Engineers engaged in these classes of work would become interested in the Society.

Mr. F. C. Gamble moved the following resolution:—"This meeting, being heartily in accord with the suggestion that the term "Civil Engineer" be given a legal definition, expresses a wish that the incoming Council would give the matter its early consideration to the end that the Governments will be induced, in justice to the profession of Civil Engineering, to accept the definition proposed, and amend such public acts as may be necessary to give legal effect to such definition." Mr. E. W. Oliver seconded the motion. A discussion followed. The motion was put to the meeting and carried by a majority of votes.

The President presented the Gzowski Medal to Mr. Seurot for his paper on "Sub-aqueous Tunnelling," and congratulated him.

Mr. Seurot expressed his appreciation of the honour bestowed upon him.

The report of the Scrutineers on Amendments to By-Laws was presented.

The President announced that the result of the ballot was to adopt the proposals submitted by the Council, thus amending By-Laws No. 8, 19, 20, 21, 22, 23, cancelling the old By-Law No. 21a and adopting a new By-Law No. 56.

The new form of the Code of Ethics was also declared to have been approved.

The report of the scrutineers for the ballot for Officers and Members of Council was presented, and the President declared the following elected:—

As President	Mr. F. C. Gamble
Vice-President for term of three years.....	Mr. A. St. Laurent
Vice-President for term of one year.....	Mr. E. E. Brydone-Jack

As Councillors Representing:—

District No. 1.....	Mr. S. P. Brown, Mr. Arthur Surveyer
District No. 2.....	Mr. C. B. Brown
District No. 3.....	Mr. T. A. J. Forrester
District No. 4.....	Mr. A. A. Dion
District No. 5.....	Mr. J. L. Weller
District No. 6.....	Mr. W. G. Chace
District No. 7.....	Mr. N. J. Ker

On invitation of the retiring President, the newly elected President, Mr. F. C. Gamble, took the Chair, and addressed the meeting as follows:—

“I am deeply sensible of the honour you have done me in selecting me as your President for this year, and fully realize the responsibilities attached to this distinguished position.

“In accepting the nomination to the presidency, the highest mark of approbation in the gift of the Society, and therefore the most enviable one, I felt it was not altogether a personal tribute, but rather a frank and thoughtful intention to recognize the claims of the Farther West, and thereby draw closer the bond of sympathy and interest which should exist between the members living at the extremes, and throughout the whole length of our country. Those residing in the West are strong and fervent in their loyalty to the parent society, and are actuated by the desire to advance by every means in their power its usefulness to the members and the country, increasing thereby its activities and authoritativeness. They look forward with confidence to the day when the Society by the individual and collective loyal efforts of all its members will attain the dignity of a great and influential national Society of Civil Engineers. This is the purpose for the attainment of which we must always strive. Once achieved, all governments, federal, provincial and municipal—private interests will see the advantage of doing likewise—will be compelled to recognize the weight and power of our Society, and, making a virtue of necessity, refer to us in the consideration and in the design of all public works having to do with the advancement, safety and health of the people.

“By being constant to our profession, loyal to each other, and to the Society, and mindful of our separate personal responsibilities, there cannot exist a doubt as to our ultimate success.

“The words of Sir Francis Bacon, familiar to you all, the great and wise philosopher, who lived over three hundred years ago, seem peculiarly apt now: ‘I hold every man a debtor to his pro-

fession, from the which as men of course, will seek to receive consequence and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto.' "

Mr. Gamble stated that he desired to impress on every member of the Society the importance of a summer meeting at Victoria. He hoped very sincerely that a large number would come to the coast, and on behalf of the members resident there he extended a cordial invitation to all.

Mr. Henry Holgate moved that the Society place in its building a memorial to the late Mr. T. C. Keefer, the first President of the Society, the memorial to take such form as the Council might deem most fitting, the expenses in connection with the same to be met either by a voluntary subscription or from the Society's funds as the Council might decide. His motion was seconded by Mr. John Kennedy, who suggested that a Committee be formed to draw up a memorial of Mr. Keefer's life. Mr. Francis seconded the proposal made by Mr. Kennedy, and both motions were carried unanimously.

On motion by Mr. Seurot, seconded by Mr. Safford, the thanks of the Society were accorded to the retiring President, Mr. Butler, and to the Council, for their arduous services on behalf of the Society during the past year. Carried unanimously.

On motion by Mr. G. A. Mountain, seconded by Colonel Anderson, the thanks of the meeting were accorded to the Reception and Introduction Committee for their very effective services. Votes of thanks were also tendered to the following corporations who had so generously contributed towards the success of the meeting:—The Canadian Pacific Railway Co.; the Grand Trunk Railway Co.; the Railways of the Eastern Passenger Association; the Cedars Rapids Manufacturing and Power Co.; and Messrs. Fraser, Brace & Co.

Mr. W. Chipman called the attention of the Council to the desirability of placing the names of the past Presidents of the Society on their portraits in order that they might be recognized by all who visited the Lecture Hall.

On the report of the sub-committee appointed the following form of words was adopted as a message to the members of the Society engaged in serving their country on the Continent:—"The Annual Meeting of the Canadian Society of Civil Engineers desires to convey to you and other members of the Society serving with the Allied Forces their best wishes."

The meeting then adjourned.

DEC 27 1918

The
Canadian Society of Civil Engineers
176 Mansfield Street, Montreal

Established February 24th, 1887.
Incorporated by Dominion Act, June 23rd, 1887
(50 Vic., Cap. 124)

REPORT
OF
ANNUAL MEETING
1916

Volume XXX

MONTREAL:

PRINTED FOR THE SOCIETY BY
"THE CANADIAN ENGINEER"

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The Canadian Society of Civil Engineers.

REPORT OF PROCEEDINGS OF THE THIRTIETH ANNUAL MEETING HELD AT THE SOCIETY'S HOUSE, 176 MANSFIELD STREET, MONTREAL, 25TH to 27TH JANUARY, 1916.

MORNING SESSION, 25TH JANUARY, 1916.

The Meeting was called to order at ten o'clock a.m. Mr. F. C. Gamble, President, occupied the Chair.

The minutes of the last Annual Meeting were read and approved.

Resolution re honour of knighthood conferred on members of the Society.

The following resolution was proposed by Mr. G. R. G. Conway, seconded by Prof. H. E. T. Haultain, and was unanimously and enthusiastically carried by a standing vote:—

“That this meeting extends to Sir John Kennedy, Past President and Hon. Member; Sir Collingwood Schreiber, Honorary Member; and to Sir Alexander Bertram, Member, its heartiest congratulations upon the order of Knighthood recently bestowed upon them by His Majesty the King.

“The Society also wishes to place upon record its appreciation of the royal and public recognition the engineering profession has received by the honours conferred upon its distinguished members who have always maintained the highest ideals of the profession. It recognizes, too, in the bestowal of these honours the growing public recognition of the engineers' influence not only in the arts of peace but also in the great ordeal the Empire is passing through at the present time.”

SIR JOHN KENNEDY.—Mr. President and Gentlemen.—“I wish to thank the members of this Society for their expression of goodwill and kindness. I am sure it is very gratifying; so much so that it is embarrassing, and I can only just thank you very heartily for myself, and I may also say for Sir Collingwood Schreiber and Sir Alexander Bertram. I look upon it as an honour to the engineering profession, as set forth in the resolution. That is the

right way to look upon it, and I have therefore felt all the higher appreciation for the honour done to us and Canadian engineers in general."

The Secretary then read a telegram from General C. J. Armstrong, Chief Engineer, Canadian Army Corps, as follows:—

"Please thank members for generous contributions Engineers' hospital fund. Greetings from all members serving Canadian Engineers to comrades at Meeting."

It was unanimously decided to send the following message in reply:—

"Members attending the Annual Meeting Canadian Society of Civil Engineers send good wishes to members at the Front in defence of the Empire. May you speedily return to us victorious."

By special resolution the same message was also telegraphed to Lt.-Col. C. H. Mitchell.

After some discussion, the President named the Auditors of the Society, Messrs. Riddell, Stead, Graham & Hutchison, represented by Mr. Pope, as scrutineers for the ballots for the election of Officers and Members of Council and for the amendments to by-laws.

REPORT OF COUNCIL FOR THE YEAR 1915.

The Council presents the following report on the work of the Society during the past year:—

ROLL OF THE SOCIETY.

Elections during the year resulted in the following additions to the Roll:—Fourteen Members, sixty-six Associate Members, two Associates, twenty-three Juniors and forty-two Students. One former Member was reinstated.

The following transfers were made:—Seventeen Associate Members to the class of Member, twelve Juniors and nineteen Students to the class of Associate Member, and ten Students to the class of Junior.

There have been removed from the rolls by resignation or on account of non-payment of dues, five Members, thirty-four Associate Members, three Associates, eleven Juniors and fifty-one Students. These resignations were due either to the fact that those concerned had ceased active engineering work or were, owing to lack of employment, unable to pay the annual dues.

The following deaths, twenty-seven in number, have been reported:—

Honorary Members.... Sir Sandford Fleming
Keefer, Thos. C., C.M.G.

Members.....Belcher, John E.
Forrest, Horatio Fred.
Grundy, George C.
Rielle, Joseph
♂ Janin, George
Johnson, Lacey R.
Leofred, F. X. Alfred
♂ Roy, Adolphe V.

Associate Members.. ♂ Cowen, Reginald Percival
♂ Delepine, H. G. S.
Elmsley, R. Sherwood
Genest, Arthur T.
Luther, C. Martin
Michaud, Joseph Louis
♂ Morrison, Thomas E.
Newlands, John E.
♂ Revell, George E.

♂ Killed in action or died as a result of wounds.

Associate Sir William C. Van Horne, K.C.M.G

Juniors..... ♂ Bell-Irving, Duncan P.
 ♂ Campbell, Thomas Callander
 ♂ Duggan, Herrick S.
 ♂ Helliwell, Joseph G.
 ♂ Rosher, John H.

Students Dombrowski, P.
 ♂ Fyshe, Francis

At present the membership stands as follows:—

Honorary Members	8
Members	693
Associate Members	1,409
Associates	34
Juniors	357
Students	575
Total	<u>3,076</u>

The membership of the Branches at the date of the last Annual Meeting was as follows:—

	Corporate.	Non-Corporate.	Total.
Quebec	51	28	79
Ottawa	161	55	216
Kingston	14	13	27
Toronto	138	104	242
Manitoba	101	48	149
Calgary	41	6	47
Vancouver	112	20	132
Victoria	52	9	61
Edmonton	32	8	40
Regina	23	4	27
	<u>725</u>	<u>295</u>	<u>1,020</u>

ANNUAL MEETING

The twenty-ninth Annual Meeting was held at 176 Mansfield Street, Montreal, in January, 1915, under the presidency of Mr. M. J. Butler, C.M.G.

The first session was called to order on Tuesday, January 26th, at 10 a.m., and the meeting was adjourned on Thursday afternoon, January 28th.

♂ Killed in action or died as a result of wounds.

MEETINGS

The Council held twenty meetings during the year.

There have been three sectional meetings, eight monthly meetings, and two Junior Section meetings of the Society.

The following papers and addresses were presented at these meetings:—

"Movable Dams," by Mr. H. B. Muckleston, M.Can.Soc.C.E.

"Shell Manufacture," by Mr. H. H. Vaughan, M.Can.Soc.C.E.

"Lethbridge Sewage Disposal Works," by Mr. A. C. D. Blanchard, M.Can.Soc.C.E.

"Heavy Guns Used in the Field," by Col. Lacey R. Johnson, M.Can.Soc.C.E.

"The Jordan River Power Development," by Mr. Chas. A. Lee, A.M.Can.Soc.C.E.

"Edmonton's Tunnel Sewerage System," by Mr. A. J. Latornell, A.M.Can.Soc.C.E.

"Tests on Shearing Resistance of Reinforced Concrete Beams," by E. Brown, A.M.Can.Soc.C.E., H. M. MacKay, M.Can.Soc.C.E., and C. M. Morssen, M.Can.Soc.C.E.

"Decay in Wood." Discussion on, introduced by Mr. F. B. Brown, M.Can.Soc.C.E.

"The Stave Falls Power Development of Western Canada Power Company, Limited," by Mr. R. F. Hayward, M.Can.Soc.C.E.

"Aviation," by Mr. J. A. D. McCurdy.

"The Development of Power in the St. Lawrence River at Cedars Rapids by the Cedars Rapids Manufacturing & Power Company," by Mr. Henry Holgate, M.Can.Soc.C.E.

"Constant Voltage Operation of a High Voltage Transmission System," by Dr. L. A. Herdt, M.Can.Soc.C.E., and Mr. E. G. Burr, A.M.Can.Soc.C.E.

"Hydraulic Development and Construction at Cedars Rapids," by Mr. J. C. Smith, M.Can.Soc.C.E.

"Electrical Design and Construction of the Cédars Rapids Manufacturing and Power Plant," by Mr. R. M. Wilson, M.Can. Soc.C.E.

"The Sea Sled," by Mr. B. O. Smith, Junior Can.Soc.C.E.

"The Cost of Modern Houses," by Mr. D. Bremner, S.Can. Soc.C.E.

BRANCH SOCIETIES

The several Branches of the Society, their Headquarters and Officers at this date are as follows:—

- Vancouver —Headquarters, Metropolitan Building.
Chairman, R. F. Hayward.
Sec.-Treas., A. K. Robertson.
- Manitoba —Headquarters, University of Manitoba, Winnipeg.
Chairman, W. G. Chace.
Sec.-Treas., A. W. Smith, Room 454, Union Station.
- Toronto —Headquarters, Engineers' Club, King Street West.
Chairman, J. R. W. Ambrose.
Sec.-Treas., C. H. R. Fuller, 106 Kendal Ave.
- Ottawa —Headquarters.
Chairman, John Murphy.
Sec.-Treas., J. B. Challies, Room 404, Union Bank Bldg.
- Kingston —Headquarters, School of Mines.
Chairman, W. P. Wilgar.
Sec.-Treas., L. W. Gill.
- Quebec —Headquarters, City Hall. (Address Box 115).
Chairman, S. S. Oliver.
Sec.-Treas., I. E. Vallée.
- Victoria —Headquarters, 408 Belmont House. (Address P.O. Box 1290).
Chairman, D. O. Lewis.
Sec.-Treas., R. W. Macintyre.
- Calgary —Headquarters. (Address Box 2318).
Chairman, Wm. Pearce.
Sec.-Treas., S. G. Porter.
- Edmonton —Headquarters, University of Alberta. (Address Box 957).
Chairman, A. T. Fraser.
Sec.-Treas., L. B. Elliot.
- Regina —Headquarters.
Chairman, O. W. Smith.
Sec.-Treas., J. N. de Stein, 2123 Retallack St.

COMMITTEES.

The following have been the Committees of Council during the year:—

Library and House Committee:

J. M. R. Fairbairn, Chairman.	S. P. Brown.
F. P. Shearwood.	R. J. Durley.
A. Surveyer.	

Finance Committee:

R. A. Ross, Chairman.	H. H. Vaughan.
C. N. Monsarrat.	E. Marceau.
G. H. Duggan.	

Committee on Meetings:

W. J. Francis, Chairman.

The Chairmen and Vice-Chairmen of Sections, and the Chairmen of Branches.

The Board of Examiners for admission of candidates under by-laws 8 and 9 was as follows:—

H. M. MacKay, Chairman.	J. M. R. Fairbairn.
A. Surveyer, Secretary.	J. Flahault.
R. S. Lea.	M. Beullac.
A. R. Roberts.	

Committee on Gzowski Medal and Prizes for Students' Papers:—

A. St. Laurent, Chairman.	R. M. Wilson.
H. E. T. Haultain.	A. B. Lambe.
E. E. Brydone-Jack.	Phelps Johnson.
W. F. Tye.	C. N. Monsarrat.

OFFICERS OF SECTIONS.

General:

W. J. Francis, Chairman.
S. P. Brown, Vice-Chairman.

Electrical:

R. M. Wilson, Chairman.
J. C. Smith, Vice-Chairman.

Sewage Disposal and Sanitation :

A. Surveyer, Chairman.	R. S. Lea.
John Kennedy.	A. F. Macallum.
W. Chipman.	A. J. McPherson.
C. H. Rust.	P. Gillespie.
W. Muir Edwards.	W. S. Lea.
J. O. Meadows.	T. Lafreniere.

Steel Bridge Specifications :

P. B. Motley, Chairman.	N. M. McLeod.
C. N. Monsarrat.	H. G. Kelley.
F. P. Shearwood.	W. A. Bowden.
J. G. LeGrand.	F. C. McMath.
G. H. Duggan.	

Conservation :

James White, Chairman.	A. E. Doucet.
C. R. Coutlee.	R. S. Lea.
H. F. Laurence.	R. W. Leonard.
R. McColl.	E. E. Brydone-Jack.
R. O. Swezey.	W. R. W. Parsons.
W. H. Breithaupt.	John Chalmers.
G. A. Bayne.	T. H. Tracy.
A. J. McPherson.	J. B. Challies.
J. S. Dennis.	C. H. Mitchell.
J. B. Hegan.	Wm. McNab.
C. E. W. Dodwell.	E. T. P. Shewen.
H. J. Cambie.	

The Electro-Technical Commission :

L. A. Herdt, Chairman.	L. A. Rosebrugh.
O. Higman.	J. Kynoch.
H. T. Barnes.	J. Murphy.
L. W. Gill.	A. B. Lambe.
W. A. Duff.	

Reinforced Concrete :

W. J. Francis, Chairman.	S. Baulne.
C. M. Morssen.	E. S. Mattice.
C. N. Monsarrat.	E. E. Brydone-Jack.
H. M. MacKay.	H. Rolph.
P. B. Motley.	P. Gillespie.
E. Brown.	

General Clauses for Specifications :

H. Holgate, Chairman.	W. Chipman.
E. G. M. Cape.	J. G. G. Kerry.
R. De L. French.	

Cast Iron Water Pipes and Specials :

F. H. Pitcher, Chairman.	A. Currie.
T. C. Irving, Jr.	C. H. Mitchell.
N. J. Ker.	C. L. Fellowes.

Roads and Pavements :

W. A. McLean, Chairman.	A. J. McPherson.
G. G. Powell.	E. A. James.
F. W. Doane.	J. Duchastel.
W. P. Brereton.	J. E. Griffith.
G. Henry.	C. H. Rust.
A. F. Macallum.	

The awards of the Gzowski Medal and of prizes for the best students' papers will be announced during the annual meeting.

As no papers have been presented on mining or metallurgical subjects during the year, there will be no award of medals in these subjects.

The following is a detailed statement of elections which have taken place since the issue of Bulletin No. 11 :

October 19th, 1915.

Associate Members :

Baggs, E.	Gill, J. E.
Fisher, S. J.	Lefebvre, J. A.
Gibeau, H. A.	

Juniors :

Milne, J. E.

Transferred from the Class of Associate Member to that of Member :

Amos, L. A.
Fergusson, H. B.
Steeves, C. McN.

Transferred from the Class of Student to that of Associate Member :

Blais, R.	Grieve, J.
Cousineau, A.	Langlais, A. Z.

Students :

Alberga, G. F.
Dorken, H. W.
Lemay, V.

November 16th, 1915.

Members :

Acres, H. G.
Mason, W. McG.

Associate Members :

Bowie, J.	Livingston, G. T.
Brakenridge, C.	Montizambert, G. C. P.
Cameron, C. S.	Philips, H. S.
Connell, C. H. N.	Reid, A. C.
De Blois, T. M.	Stirrett, G. P.
Dickson, W.	Van Scoyoc, H. S.
Henderson, C. E.	

Juniors :

Bunting, H. L.
McLaren, W. C.

Transferred from the Class of Associate Member to that of Member :

De Stein, J. N.

Transferred from the Class of Junior to that of Associate Member :

Horne, E. W.
Sherman, N. C.

Transferred from the Class of Student to that of Associate Member :

Barrette, A. O.
Ewing, W. A.
Wykes, H.

Students :

Alberga, A. M.	Kirkpatrick, P. C.
Anderson, A. M.	McAvoy, R.
Ball, S.	Murray, Jas.
Bayne, C. MacV.	Ryan, C. W.
Dawson, J. K.	Stewart, A. E.
Haney, R. F.	Thorn, G. O.
Hugo, R.	Tison, M.

December 21st, 1915.

Members :

Fortin, S. J.

Associate Members :

Attwood, C. H.	Lachance, J. O.
Dallyn, F. A.	Macleod, J. S.
d'Orsonnens, A. d'O.	Perrin, A. T.
Fox, C. J.	Peters, G. M.
Kinghorn, B. H.	Swan, H. L.

Juniors :

Altherr, E.	Kolling, P. I.
Bernier, J. A.	Parker, G. C.
Goodman, H. M.	West, C. W.

Transferred from the Class of Junior to that of Associate Member :

Taylor, W.

Transferred from the Class of Student to that of Associate Member :

Murphy, E. P.

Transferred from the Class of Student to that of Junior :

Adsett, F. C.

Students :

Allan, E. B.	Pringle, J. E.
DeCew, L.	Tanton, J. F.
Gilley, J. R.	Tilston, C. E.
Hughes, C. A.	Ward, R. C.
MacLean, D. G.	

As reported in Bulletin No. 11, the Committees on Track and on Rails have been discontinued for the present in view of the fact that the functions of these Committees are overlapped by the similar Committees of the American Railway Engineering Association.

A Committee on Roads and Pavements has been added to the list of those named at the Annual Meeting.

The Committee on Cement Specifications, which has been re-constituted, has presented a report with a proposed standard specification. This report and specification are distributed herewith. The specification will come before the Annual Meeting for discussion and adoption. Reports have also been distributed to the membership for consideration in advance of the Annual Meeting by the Committees on Conservation, Roads and Pavements, the Electro-Technical Commission, Steel Bridge Specifications, and Educational Requirements.

Early in the year the Council made a representation to the Department of Railways and Canals, at Ottawa, to the effect that the Society's Specification for Steel Bridges should be adopted by the Dominion Government. The matter is still under the consideration of the Chief Engineer of the Department.

The special September meeting of the Council, in connection with which during the past two years the travelling expenses of members from outside points have been paid by the Society, was not convened this year owing to the financial situation. The Council, however, considers that in view of the importance of unifying the interests of the members residing in various parts of the country, it will be desirable, so soon as the funds at the disposal of the Society permit, to establish a regular series of Council meetings for which a liberal mileage payment shall be made to non-resident members. It is suggested that at the outset possibly three such meetings during the year held in the months of January, May and September might be advantageous.

The following is a statement in regard to the members of the Society who have, so far as information has been received, enlisted for overseas service:—

Hon. Member	1
Members	34
Associate Members	144
Associate	1
Juniors	85
Students	89

In all 354

Of these there have been killed in action or died of wounds:—

Members	2
Associate Members	4
Juniors	5
Student	1

In all 12

The special funds for which subscriptions have been received from the members are as follows:—

Fund in aid of families of members who have enlisted for active service in the army, total..	\$2,093.00
There has been paid out on account of this fund..	132.40
Canadian Engineers' Hospital and Medical Com- forts Fund, total	703.45
There has been paid out on account of this fund..	450.55

The proposed excursion to the Pacific Coast, in connection with which free haulage of the Society's train had been generously provided for by the Grand Trunk, Transcontinental, Grand Trunk Pacific and Canadian Pacific Railways, had to be abandoned on account of the very small number of members (nine in all) who said that they would avail themselves of the privileges extended to them.

As indicated on a previous page of this report, there are now ten Branches of the Society, the last to be formed being that at Regina, at present under the Chairmanship of Mr. O. W. Smith.

The first Provincial Division to be formed under By-Law 54 was organized in Vancouver, for British Columbia, in July last and duly authorized by the Council at its meeting on July 20th. The names of the officers of this Division have not yet been reported.

Early in the year an effort was made to have this Society placed upon the list of educational institutions from which, under the City Charter, the civic tax is not exigible. The matter is again being taken up, it is hoped with some promise of success.

On the request of some of the members interested, the Council has memorialized the Dominion Government asking for the appointment of a Commission to revise the Patent Act.

An effort will be made during the approaching session of the Dominion Parliament to obtain an Act defining the term Civil Engineer.

Some consideration has been given during the year to publicity matters affecting the profession of civil engineering. A circular

is about to be issued with a view to instructing municipalities as to the advisability of employing only corporate members of the Society. It is also proposed to request corporate members when advertising for assistants to require that candidates shall be members of the Society.

A Special Committee, appointed by the Council, has under consideration the best means of securing the appointment of engineers on Civic Boards, and commends the matter to the membership in general as one which is deserving of their active support.

The case of a member having an office in Vancouver, against whom charges of unprofessional conduct were made by other resident members in Vancouver, was investigated by the Council. The member was requested to withdraw his statements, in a satisfactory manner, or resign. The terms of his apology not being found acceptable, the member's resignation was accepted.

Alleged unprofessional conduct by another member of this Society is at the present time under investigation in terms of the Society's By-Law 19 and Code of Ethics.

During the past summer representations were made to the Council and Board of Commissioners of the City of Montreal as to the advisability of obtaining a report from an independent Board of Engineers, upon certain proposed expenditures in connection with the aqueduct enlargement. This action of the Council of the Society has received the support of the Montreal Board of Trade, but it is regretted that the Board of Commissioners did not meet the representations in the spirit that actuated the Council of the Society.

The Council has memorialized the Dominion Government in connection with the appointment of foreign engineers on Government commissions, and has urged that inasmuch as, in some recent appointments noted, there should have been no difficulty in obtaining the services of eminently qualified Canadian engineers, it was not in the interests of the country that such appointments should be made.

The Society has been represented by delegates, specially named by the Council, at the following congresses and meetings during the year:—The International Engineering Congress, San Francisco; the Western Canada Irrigation Association, Bassano; the Annual Meeting of the American Institute of Mining Engineers, New York.

F. C. GAMBLE, President.

C. H. MCLEOD, Secretary.

December 30th, 1915.

REPORT OF THE LIBRARY AND HOUSE COMMITTEE.

MEMBERS OF COMMITTEE.

F. P. Shearwood, S. P. Brown,
 A. Surveyer, R. J. Durley,
 J. M. R. Fairbairn, Chairman.

In view of the existing financial conditions, but few books have been bought during the current year.

The following are the works which, on special request, have been added to the library by purchase:—

“Engineering Index for the Thirty-First Year.”

“Transactions of the National Conference on City Planning.”

“Twenty-Sixth Annual Report on the Statistics of Railways for 1913.”

Presentations have been made as follows:—

By Members:

By R. Armour, M.Can.Soc.C.E.

“Eclectic Engineering Magazine,” Vols. X.-XXVII.

By A. H. Blanchard, M.Can.Soc.C.E.

“Annual Report of the New York Department of Efficiency and Economy concerning matters relating to the Construction and Maintenance of Public Highways.”

By J. B. Challies, M.Can.Soc.C.E.

“Water Powers of British Columbia,” by G. R. G. Conway, M.Can.Soc.C.E.

“Water Powers of the Prairie Provinces,” by P. H. Mitchell, A.M.Can.Soc.C.E.

“Water Powers of Ontario,” by H. G. Acres.

“Water Powers of Quebec,” by F. T. Kaelin, A.M.Can.Soc.C.E.

“Water Powers of the Maritime Provinces,” by K. H. Smith, A.M.Can.Soc.C.E.

By F. H. Fay, M.Can.Soc.C.E.

“Report of Watuppa Ponds and Quequechan River Commission, City of Fall River.”

By the author, C. E. Fowler, M.Can.Soc.C.E.

“The San Francisco-Oakland Cantilever Bridge.”

By Association des Anciens Elèves de l'Ecole Polytechnique.

“Revue Trimestrielle Canadienne.”

By W. R. Goodwin, A.M.Can.Soc.C.E.

“Excavating Machinery,” by A. B. McDanniell.

By W. R. Pilsworth, M.Can.Soc.C.E.

“The Influence of Sea Power upon History, 1660-1783,” by Capt. A. T. Mahan.

By non-Members:

By Lawrence J. Burpee, International Joint Commission, Ottawa.

"Progress Report in the Pollution of Boundary Waters Investigation."

By Francis C. Smith and W. H. Smith, Publishers.

"The Engineer's Year-Book of Formulae, Rules, Tables, Data, etc., for 1915," by H. R. Kempe.

By Barclay Parsons & Klapp, Consulting Engineers.

"Report on Detroit Street Railway Traffic and Proposed Subway."

By the Geological Survey, Department of Mines, Ottawa.

"Geology of the North American Cordillera at the Forty-Ninth Parallel," by R. A. Daly.

By the Authors.

"Pennsylvania State Railroad Commission," Vol. II., by Ford, Bacon and Davis.

By G. S. Webster, Chief Engineer.

"Report on the Collection and Treatment of the Sewage of the City of Philadelphia, 1914."

By the U.S.A. Government.

"War Department Annual Reports, 1914," Vol. II. Report of the Chief of Engineers.

By Longmans, Green & Co.

"Rivington's Notes on Building Construction," Parts I. and II., edited by W. N. Twelvetrees.

By John Wiley & Sons.

"Elements of Highway Engineering," by A. H. Blanchard.

By the Department of Marine and Fisheries, Ottawa.

"Report on the Dominion Government Expedition to the Northern Waters and Arctic Archipelago of the D.G.S. 'Arctic' in 1910."

The technical magazines, transactions, etc., which have been received during the year are substantially the same as those listed in the Report for 1914. They number in all 85. Of these 67 are exchanges and 18 are paid for. 28 are marked for binding at the end of the year, and are to be placed on the library shelves.

The Committee has pleasure in calling the attention of members to the tablet, which has been placed on the wall of the entrance hall, in commemoration of Thomas Coltrin Keefer, C.M.G., the first President of the Society.

J. M. R. FAIRBAIRN,

Chairman.

December 30th, 1915.

CANADIAN SOCIETY OF CIVIL ENGINEERS.
STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR ENDED 31st DECEMBER, 1915.

<i>Receipts.</i>		<i>Expenditure.</i>	
SUBSCRIPTIONS—		INTEREST—On Mortgage to 31st	
Arrears of Fees Collected....	\$ 6,732.80	Dec., 1915	\$ 1,200.00
Current Fees Collected.....	12,437.67	Printing and Stationery, including	
Advance Fees Collected.....	139.16	Transactions	5,969.79
Entrance Fees Collected.....	2,233.05	Books, Magazines and Library	
	<u>\$21,542.68</u>	Expenses	98.24
INTEREST—		Postage, Post Cards and Tele-	
Savings Bank Account	\$ 12.91	grams	1,887.38
Overdue Fees	437.08	Salaries of Secretary and Office	
	<u>449.99</u>	Staff	3,768.50
SALES OF TRANSACTIONS AND		Caretakers' Wages	1,140.00
PERIODICALS	48.70	Taxes	1,086.76
DIVIDENDS—		Water Rates	194.00
Can. Per. & West. Can. Mtg.		Expenses—Annual Meeting	86.00
Corp. stock	\$ 18.00	Expenses—Ordinary Meetings	225.85
Montreal Light, Heat, & Power		Coal and Wood	401.99
Co. stock	20.00	Electric Light and Power.....	178.72
	<u>38.00</u>	Gas	29.10
		Repairs and House Supplies.....	113.89
		Insurance	28.00
		Telephone—Rent and Tolls	141.55
		Cabs, Cartage, etc.	3.60
Forward	<u>\$22,079.37</u>	Forward	<u>\$16,553.37</u>

STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR ENDED 31st DECEMBER, 1915.

Report of Council

19

<i>Receipts.</i>	<i>Expenditure.</i>
Carried forward	\$16,553.37
\$22,079.37	149.75
	150.00
	16.52
	493.15
	37.60
	100.00
	7.90
	REBATES OF FEES TO BRANCH SOCIETIES—
	Toronto \$ 440.50
	Quebec 235.50
	Winnipeg 322.00
	Ottawa 581.25
	Vancouver 299.50
	Kingston 34.50
	Victoria 146.50
	Calgary 99.00
	Regina 35.00
	Edmonton 72.50
	\$ 2,266.25

TOTAL EXPENDITURE ON REVENUE	
ACCOUNT	\$19,774.54
BALANCE—Being excess of Receipts over Expenditure for year ending 31st December, 1915	2,304.83

\$22,079.37

Receipts.

Carried forward \$22,079.37

Verified, RIDDELL, STEAD, GRAHAM & HUTCHISON, C.A.,
Auditors.
Montreal, 7th January, 1916.

\$22,079.37

CANADIAN SOCIETY OF CIVIL ENGINEERS.

STATEMENT OF ASSETS AND LIABILITIES AS AT 31st DECEMBER, 1915.

<i>Assets.</i>		<i>Liabilities.</i>	
PROPERTY ACCOUNT	\$ 89,041.64	PRIZE FUND ACCOUNT	\$ 468.77
FURNITURE—		ROYAL INSTITUTION FOR	
Balance at 31st December,		THE ADVANCEMENT	
1914	\$3,065.30	OF LEARNING—	
Less 10% written off for De-		Mortgage on Mans-	
preciation	306.53	field St. Property	\$20,000.00
		at 6%	200.00
BOOKS—Estimated value	\$ 2,758.77	Interest accrued	
ARREARS OF FEES—Estimated	6,250.00	thereon to date...	200.00
value	5,000.00		
CANADA PERMANENT & WESTERN		ACCOUNTS PAYABLE ..	\$ 20,200.00
CANADA MORTGAGE CORPOR-		SUNDRY REBATES DUE	2,143.96
ATION—Stock	180.00	TO BRANCHES	755.50
MONTREAL LIGHT, HEAT & POWER			
Co.—Stock	120.50		
GOLD MEDAL	45.00		
LOAN TO OTTAWA BRANCH.....	\$ 300.00		
Less Repaid	100.00		
CASH ON HAND AND IN BANK.....	200.00		
PETTY CASH ON HAND.....	2,694.17		
	142.69		
Forward	\$106,432.77	Forward	\$ 23,568.23

CONTINUATION OF
STATEMENT OF ASSETS AND LIABILITIES AS AT 31st DECEMBER, 1915.

<i>Assets.</i>		<i>Liabilities.</i>	
Carried forward	\$106,432.77	Carried forward ..	\$ 23,568.23
		SURPLUS—	
		Balance at 31st December, 1914 ...	\$80,766.24
		Add—Receipts on Revenue Account. \$22,079.37	
		Less Expenditure on Revenue Account. 19,774.54	
			<u>\$ 2,304.83</u>
		Estimated value of Books added to Library	<u>\$83,071.07</u>
			100.00
			<u>\$83,171.07</u>
		Less—Written off for Depreciation on Furniture	306.53
			<u>\$ 82,864.54</u>
	<u>\$106,432.77</u>		<u>\$106,432.77</u>

Montreal, 7th January, 1916.

Verified, RIDDELL, STEAD, GRAHAM & HUTCHISON, C.A.,
Auditors.

Obituaries

FLEMING, SIR SANDFORD, K.C.M.G., Hon. M.Can.Soc.C.E., was born at Kirkcaldy, Scotland, in 1827. He came to Canada at the age of 18 and began his engineering work on the Northern Railway, one of the pioneer lines of Ontario, running northward from Toronto into unsettled regions, and since absorbed into the Grand Trunk System.

In 1863 he was chosen by the people of the Red River Settlement, now part of Manitoba, to go to England in order to urge upon the Imperial authorities the necessity of establishing railway communication between the eastern and western portions of Canada. Shortly after this, he was appointed by the Governments of Nova Scotia, New Brunswick and United Canada in conjunction with the British Government to find a route for the Intercolonial Railway from Halifax to Quebec. Sir Sandford was chief engineer of this railway during its construction. In 1871 he was appointed engineer-in-chief to carry out the Pacific Railway surveys. In 1872 he conducted the expedition, the results of which are embodied in Principal Grant's book "From Ocean to Ocean." During this time he also carried out the first survey of a railway across the island of Newfoundland, the outcome of which is the road there built and operated by the Reid Company. Sir Sandford continued his work in connection with the Canadian Pacific Railway until 1880, when owing to political exigencies he retired, having witnessed its progress until 2,000 miles of railway were under construction.

One of the most interesting achievements credited to Sir Sandford was the adoption by the railroads of this country of the standard English or Greenwich time. He was unquestionably the initiator and a principal agent in the movement for reform in time reckoning.

Having realized as engineer of the Pacific Railway, the advantages of a Pacific cable, Sir Sandford submitted to the Government a plan for such a project in 1879. This was the beginning of an agitation which he led with noble persistence for 23 years, until at last his efforts were crowned with success.

His continued activity in behalf of movements for a closer unity of the Empire, his writings and speeches in various branches

of science and literature, and his work as chancellor of Queen's University, Kingston, since 1880, gave him a life of constant usefulness in his old age. Knighthood was bestowed upon him in 1897. He was the recipient of many scholastic degrees in Great Britain, Canada and in the United States, and was elected to prominent offices in societies and organizations of the highest scientific standing in many parts of the world.

He died at Halifax on July 22nd, 1915.

KEEFER, THOMAS COLTRIN, C.M.G., LL.D., Hon. M.Can.Soc. C.E., was born at Thorold, Ont., in 1821. Mr. Keefer was educated at Upper Canada College. His first engineering work was on the Erie Canal. Later, he became associated with the Welland Canal construction, and in 1845 was made chief engineer of improvement works on the Ottawa River. Many of his early designs are still in evidence among the lumber industries of that river. In 1849, one of his most important publications entitled "The Philosophy of Railways" appeared. This book greatly influenced the governmental policy regarding the construction of railways in Canada. In 1850, he entered the service of the government to make a survey of the rapids of the St. Lawrence, with a view to the improvement of its navigation by the exploration of easier and safer routes, and also to the construction of a canal or railway between the St. Lawrence and the Upper St. John waters of Lake Temiscouata. In the same year he won Lord Elgin's prize by virtue of his book entitled "The Influence of the Canals of Canada on Her Agriculture." He assisted in the preparation of reports on the trade of British North America, and his knowledge and grasp of the commercial situation were such as to be very instrumental later in the drafting of the Reciprocity Treaty of 1884.

Mr. Keefer was appointed Commissioner for Canada to the First International Exposition in London in 1851. He again visited London in the same capacity in 1862. In 1878, he was appointed Executive Commissioner at the Paris Exposition, where he served on the International Jury of Engineering and Architecture. He was at this time made a Companion of the Order of St. Michael and St. George by Her Majesty, the late Queen Victoria, and was also elected an Officer in the Legion of Honour (France).

After his investigation of the St. Lawrence for the Government, Mr. Keefer engaged in preliminary surveys for the Grand Trunk Railway for the line between Montreal and Toronto. He also prepared a report and plans for bridging the St. Lawrence at Point St. Charles, and from his report and designs the Victoria

Bridge was built. He designed and built Montreal's first aqueduct, and in 1874-5 as chief engineer of the Ottawa Waterworks Commission, he laid out and constructed the Ottawa system. He was afterwards for a number of years engineer to the Montreal Harbour Commission. Mr. Keefer still continued to take the keenest interest in railway development, and it was largely owing to his efforts that the change was effected from narrow gauge track to the present standard gauge on Canadian Railways.

Of some of his many attainments in the more mature years of his life, those meriting special mention are his appointments as chairman of the Royal Commission on Ice Floods, and as member of the International Deep Waterways Commission. He was Fellow of the Royal Society of Canada. Mr. Keefer was associated with many scientific societies and clubs. He served as Vice-President for two periods in the American Society of Civil Engineers, and in 1888 was appointed President of that body. He was also a member of the Institution of Civil Engineers of England. His association with the Canadian Society of Civil Engineers is very well known. He was one of its founders and was twice its President. He was made an Hon. Member in 1903.

Mr. Keefer was one of Canada's Grand Old Men. As a man and as an engineer he has won an esteem that time will take long to obliterate.

He died at the Manor House, Rockcliffe, Ottawa, on 7th January, 1915.

BELCHER, JOHN E., M.Can.Soc.C.E. was born in Cork, Ireland, in 1834. He was educated at Queen's University, Cork, and was afterwards articled with his father, S. R. Belcher, Architect. He was appointed assistant to Sir John Benson, Engineer of the Cork Harbour Board. Later Mr. Belcher was engineer on the improvement and completion of the work on the River Blackwater. In 1860, he was engaged on important engineering works in Liverpool. In 1869 Mr. Belcher came to Canada, and was for a number of years town and county engineer of Peterborough. He held the latter position for forty years, and may be said to have built every bridge in the county. As an architect, he designed nearly every large and public building in Peterborough. He became associated with the Canadian Society of Civil Engineers during the first year of its formation. He was also a member of the Ontario Association of Architects, and was at one time its President.

He died in Peterborough on August 20th, 1915.

FORREST, HORATIO F., M.Can.Soc.C.E., was born at Montreal in 1839. Mr. Forrest was educated in the Military College at Quebec, and engaged in Civil Engineering on the Intercolonial Railway. Later he identified himself with the Canadian Pacific Railway, and in 1873 assisted in the location of the line from Kenora to Winnipeg. He was afterwards appointed government inspector of railways, which position he held for a number of years. He then entered the employ of the Canadian Northern Railway as District Engineer, which position he resigned two years ago on account of ill-health.

He died in Winnipeg in January, 1915.

GRUNDY, GEORGE GEOFFREY, M.Can.Soc.C.E., was born at Brecon, Wales, 12th June, 1877, and was educated at Christ College, Brecon. For four years Mr. Grundy was draughtsman on the Quebec Central Railway, Sherbrooke. In 1898, he was appointed resident engineer on construction Crow's Nest Branch Canadian Pacific Railway. From 1898 to 1900, he was resident engineer with Mackenzie, Mann & Co. For eight years he occupied the position of superintendent and engineer of the Temiscouata Railway, Riviere du Loup, Que., and from 1909 until his death, he was secretary and general manager of the same railway.

He died on June 9th, 1915.

JANIN, GEORGE A. F. R. (Major), M.Can.Soc.C.E., was born at Poitiers, France, 23rd December, 1853. He was educated at Lycee Imperial University, Poitiers, and was afterwards for three years in military service. For twenty years, 1873-93, he was sub-chief of section Government staff of Engineers, France. After coming to Canada, Mr. Janin engaged in private practice at Montreal. In 1899, he was appointed consulting engineer, Provincial Board of Health, and since 1900 had been chief engineer and superintendent Montreal Waterworks.

After the outbreak of the war, Major Janin raised a company of engineers, many of whom were reservists in the employ of the City of Montreal. He was granted an indefinite leave of absence by the City, and went to France with his Company. After being in the fighting line for some time, Major Janin left for England on account of illness. He was drowned in the steamer Anglia which was sunk by a mine in the English Channel.

JOHNSON, LACEY R., M.Can.Soc.C.E., was born at Abington, Eng., 22nd June, 1855. He was educated at Abington Grammar

School, and later apprenticed at the Great Western Railway works, Swindon, Eng. For two years Mr. Johnson was associated with the Royal Carriage Department, Woolwich Arsenal, and later was manager of the G. Davis & Sons Engineering works, London. Before coming to Canada, he was for three years with the Scindia Punjaub & Delhi Railway Co., India. In Canada he was employed in various engineering capacities in the Grand Trunk and the Canadian Pacific Railways. From the commencement of the Transpacific service his jurisdiction was extended over the engineering department of ocean liners, during which time he spent three winters in Hong Kong, China, superintending alterations and repairs to the company's vessels. In 1901, on the purchase of the Canadian Pacific Navigation Company by the C.P.R. he was appointed Superintending Engineer of the combined fleets. From 1901 to 1912, Mr. Johnson was Assistant Superintendent of Motive Power C.P.R., Montreal, and from 1912 to 1915, General Superintendent Angus Shops District, C.P.R. He was in command as Lieut.-Colonel of the Montreal Heavy Brigade of Artillery.

He died in Montreal on April 17th, 1915.

LEOFRED, F. X. A., M.Can.Soc.C.E., was born at St. Anselme, P.Q., 16th September, 1862. He was educated at Ecole Polytechnique and McGill University, Montreal. In 1890, Mr. Leofred became a Land Surveyor, and was a member of the Board of Directors Quebec Land Surveyors from 1909 until his death. He practiced as a mining engineer in Quebec and Montreal for some years, and afterwards went to Levis, Que., where he was engaged in private practice, devoting most of his time to various water-works problems.

He died at Charny, Que., 8th February, 1915.

RIELLE, JOSEPH, M.Can.Soc.C.E., Q.L.S., was born at Laprairie, Que., 6th October, 1833. After serving as pupil in the office of Ostel and Perrault, Mr. Rielle was appointed engineer for the Harbour Commissioners of Montreal in the early sixties of last century. While in this office he made extensive observations on the flow of the St. Lawrence in order to determine its high water mark and the boundaries of riparian proprietors on the Island of Montreal. He was closely connected with the early developments of railways in Montreal, and was at one time Vice-President of the Pontiac Pacific Junction Railway. For over twenty years he was secretary and inspector for the Turnpike Trust Company, which controlled most of the roads about Montreal. Mr. Rielle's achievements as a Land

Surveyor will be best remembered. He had a profound knowledge of the laws of the Province of Quebec with reference to lands and their measurement, and his advice was sought by many professional and business men in Montreal. He also made a very thorough study of the old French measures which are still in force in the Province of Quebec, and worked out well-known tables showing their relations with English standards.

As a professional man, Mr. Rielle set a high standard of earnest, hard work and personal integrity.

He died at his home in Montreal on 9th May, 1915.

ROY, ADOLPHE V. (Major), M.Can.Soc.C.E., was born at Montreal, 7th December, 1868. He was educated at Ecole Nationale des Ponts et Chaussees and Ecole Centrale des Arts and Manufactures, Paris. Major Roy was appointed engineer and superintendent of Forests for Quebec Province at the World's Fair, Chicago. He practiced as a mining engineer in Tunis, North Africa, and in Alaska. Later he was in private practice in Montreal. He was a member of the Societe Civils des Ingenieurs de France, and of many other well known societies and clubs.

Major Roy went to the war with the 22nd French Canadian Regiment commanded by Col. Gaudet. He was killed in action in October, 1915. He has been described as "one of the finest soldiers that ever faced a foe."

COWAN, REGINALD P. (Lieut.), A.M.Can.Soc.C.E., was born at Dalston, England, 21st August, 1884. He graduated in Mining at McGill University and at the University of Freiburg. Mr. Cowan spent two years prospecting in Northern Ontario. In 1910 he became associated as engineer with the Atlas Construction Company, and in 1912 was appointed Vice-President of the Company. In 1914 he resigned from this position to go to Australia. While in England en route for Australia, war broke out, and he enlisted as a private in the Sixth Border Regiment. He was later granted a commission in the same battalion. In 1915, he was made regimental signalling officer. His regiment was sent to Gallipoli, where he took part in several heavy engagements and experienced great hardships from lack of water. He was taken ill and died August 16th, 1915, on board ship, before reaching Italy.

DELEPINE, HELENNIS G. S. (Lieut.), A.M.Can.Soc.C.E., was born in London, 21st October, 1888. He was educated in Geneva and at the Victoria University of Manchester, from which latter

place he graduated with honours. Mr. Delepine came to Canada in 1910, and was for a time a demonstrator in engineering at McGill University. From 1911-1913, he was assistant engineer with Messrs. Waddell & Harrington, of Kansas City. He returned to Manchester in 1913, having been appointed junior instructor in Drawing and Demonstrator in the engineering department of Victoria University. While in this capacity he obtained the degree of M.Sc. In 1914, he became assistant engineer in the airship department of Messrs. Vickers at Barrow-in-Furness. He volunteered for active service later, and received a commission as Second Lieutenant in the Duke of Cornwall's Light Infantry. In January, 1915, he was sent to Northern France, where he was killed in action on 16th April, 1915.

ELMSLEY, SHERWOOD, A.M.Can.Soc.C.E., was born at Leamington, England, 5th May, 1873. He was educated at the Royal Indian Engineering College, Cooper's Hill, England. For several years Mr. Elmsley was on draughting and location work for the Canadian Pacific Railway, and was also resident engineer on location and maintenance. In 1905-6, he was location engineer for the Alaska Central Railway, the Cascade Valley River Railway, and the T. & N. O. Ry. For several years Mr. Elmsley was in private practice engaged in prospecting, exploring, etc., and in government work.

He died in Toronto on March 17th, 1915.

GENEST, ARTHUR T., A.M.Can.Soc.C.E., P.L.S. and D.L.S., was born at Fermont, P.Q., July 10th, 1859. He was educated at St. Joseph's College, Three Rivers, Que., and had his early engineering training in Railway location and construction on the Q. M. & O. Ry. Mr. Genest was district engineer in charge of location on the Laurentian Ry., now a part of the Canadian Northern Railway; contractor's engineer on construction of the Pontiac Pacific Junction Ry., now the Ottawa and Waltham Ry.; First Assistant Engineer on the enlargement of the Lachine Canal; First Assistant Engineer Rapid Plat & Farran's Point Canal; Division Engineer Balsam Simcoe Lake Division on construction of Trent Canal; Engineer in charge, Final Estimates Cornwall Canal Enlargement. Since 1904, Mr. Genest was assistant engineer at headquarters of the projected Georgian Bay Ship Canal. He was also engaged on various surveys, including some in Northern Quebec for the Provincial Government. Mr. Genest was a member of many Scientific Societies, and was a contributor to the French

and English Press. He founded "The Clarion," the first daily newspaper published at Three Rivers, in 1884.

He died in Ottawa on 27th January, 1915.

LUTHER, C. MARTIN, A.M.Can.Soc.C.E., was born in Marash, Armenia, 1875. He graduated from the Central Turkey College and came to the United States in 1897. He took the Civil Engineering Course at Yale University, graduating in 1901, and was then selected to go as an Instructor to the Philippines, where he remained for two years. After he returned to the United States he filled positions with the N.Y., N.H. & H.R.R., the New York Central Railway, and the American Bridge Company. He entered the service of Mackenzie, Mann & Co., Limited, in 1908, and had charge of the design of concrete and masonry structures for their work in Eastern Canada until his death on 8th December, 1915.

MICHAUD, JOSEPH LOUIS, A.M.Can.Soc.C.E., P.L.S., and D.L.S., was born in Rimouski in 1851. After holding various engineering positions of responsibility, Mr. Michaud was appointed District Engineer of the Department of Public Works in the District of Montreal in 1896, which position he held until January, 1915, when he was appointed Consulting Engineer for the Department of Public Works.

He died in Montreal on 14th November, 1915.

MORRISON, THOMAS E. (Capt.), A.M.Can.Soc.C.E., was born in Quebec on 8th July, 1887. He was a graduate in Civil Engineering of the Royal Military College, Kingston. His first engineering work was as Asst. Div. Officer No. 1 Halifax Fortress. In 1909 he was appointed Division Officer. Mr. Morrison was Asst. to Camp Engineer, Niagara Camp, and was later appointed Division Officer, Royal Canadian Engineers, Toronto.

He left Canada with the first contingent as a Captain in the Canadian Engineers Corps, and was killed in action on 15th June, 1915.

NEWLANDS, JOHN ERIC, A.M.Can.Soc.C.E., was born in Edinburgh, 12th December, 1881. He was educated at Edinburgh University, from which he graduated with degree B.Sc. in 1903. Mr. Newlands received most of his engineering experience with the Canadian Pacific Railway in various departments. In 1906, he was appointed resident engineer on the construction of a branch line of this railway out of Montreal. He was afterwards transferred to the Irrigation Department of the Company near Calgary, and had

charge as Division Engineer of the construction of over 1,000 miles of main and distributing canals. He continued in charge of this work until its completion in September, 1914, when he returned to England. While in England, he received from the Colonial Office an important administrative appointment in West Africa, and was to have entered upon his duties on 28th April, 1915.

He died in London on 26th April, 1915.

REVELL, GEORGE ERNEST, A.M.Can.Soc.C.E., was born at Woodstock, Ont., on the 4th of August, 1877. He was a B.Sc. of the University of Toronto. After graduation Mr. Revell was employed as assistant engineer on the Trent Canal Surveys, and on the works of Messrs. Ross & Holgate at Seven Islands, and at the West Kootenay Power & Light Company. In 1906 he entered the service of the British Columbia Government, later associating himself with Messrs. Green Bros. & Burden, Surveyors, Nelson, and obtained his diploma as a B.C. Land Surveyor. When war broke out he went to Vancouver and was one of the first to enlist in the Engineers. He declined a commission, preferring the work of a sapper. In this capacity he with several others placed a large mine beneath the front line of German trenches. While waiting for it to explode he and seven of his companions were killed by a German 12-inch shell on 15th June, 1915. He was buried with his companions in the crater of the shell hole where he fell.

VAN HORNE (SIR) WILLIAM, K.C.M.G., A.Can.Soc.C.E., was born in 1843. Sir William was one of the most prominent of Canadian railroad men, and was in a great measure responsible for the speedy construction and successful development of the Canadian Pacific Railway, of which he became General Manager in 1882. In 1888, he was made President of the Company, which position he occupied for eleven years, resigning to become Chairman of the Board of Directors, in which capacity he served until 1910. He remained a director of the Company until his death. Sir William received his early training with the Illinois Central and the Michigan Central Railways. In 1874 he was appointed General Manager of the Southern Minnesota Railway, and was later its President. He was afterwards associated with the Chicago, Milwaukee & St. Paul Railway as General Superintendent, which position he resigned to become General Manager of the Canadian Pacific Railway.

Sir William was a man of large and varied interests, and was connected in a high official capacity with many great enterprises.

Among these were the Cuba Railway Company, of which he was President. He was also President of the Laurentide Paper Company, Canadian Salt Company, and the Demerara Electric Company. He was Vice-President of the Dominion Iron & Steel Company, the St. Paul & S.S.M. Railway, Dominion Coal Company, Mexican Light & Power Company, and many others.

In spite of his many business interests, Sir William devoted much time to art. His collection of paintings is one of the finest in Canada, and he was himself an artist of no mean order.

He died at Montreal on September 11th, 1915.

BELL-IRVING, DUNCAN PETER (Lieut.), Junior Can.Soc.C.E., was born at Bushey, Eng., 3rd January, 1888. After graduating from the Royal Military College, Kingston, Mr. Bell-Irving was on location work for the Canadian Northern Railway. He was afterwards engaged by the contractors in field tunnel work for the Canadian Pacific Railway. He obtained his diploma as a British Columbia Land Surveyor, and was engaged in Government survey work in the west until the outbreak of the war. He obtained a commission in the Second Field Company, Canadian Engineers, with the First Canadian Contingent, and was killed at Le Tognet, Belgium, on 25th February, 1915.

CAMPBELL, THOMAS CALLENDER (Lieut.), Junior Can.Soc.C.E., was born in India, 22nd October, 1887. He was educated at Queen's College, Galway, and after graduation came to Canada in 1911. He commenced work in the Engineering Department of the Canadian Pacific Railway, with headquarters at Montreal. He was afterwards employed on the preliminary survey work of the Mount Royal Tunnel in Montreal. In 1912 Mr. Campbell came to Ottawa as a member of the staff of Messrs. Hazen & Whipple, who at that time were designing a Water Purification Plant for the City of Ottawa. On the completion of this work he became a member of the staff of the City Waterworks Department in Ottawa. In 1913 Mr. Campbell became Chief Assistant to the John verMehr Engineering Company, of Toronto, and was engaged on the design and construction of the new Water Purification Plant for the City of Toronto.

In September, 1914, Mr. Campbell left Toronto for England where he joined one of the University Training Corps. From this he received a Commission in the Royal Engineers, and after being stationed at several Military Camps in England, landed at the Dardanelles in July, 1915. The first day he was in the trenches

he was slightly wounded but soon recovered. Early in October he was, however, severely wounded and died on board ship on October 8th, 1915, while being conveyed back to England.

DUGGAN, HERRICK STEVENSON (Lieut.), Junior Can.Soc.C.E., was born in Montreal, March 9th, 1891. After preliminary training at St. Albans' School, Brockville, he matriculated in Arts, McGill University in 1906. He spent a year in Europe, principally at a Swiss school, and entered the Arts course of McGill University in 1907. In 1908, he entered the Mechanical Engineering Course, and graduated in Mechanical Engineering, 1912. After graduating he joined the Engineering Staff of the Dominion Bridge Company, and was with that Company and the St. Lawrence Bridge Company until October, 1913, when he went to Germany to enter the employ of the Maschinen Fabrik, Augsburg-Nuremburg at Mainz.

He returned to the Dominion Bridge Company in July, 1914, and was employed in the erection of various works, principally on the Canadian Northern Railway and on bridges in the City of Quebec, until October, 1914, when he went to England to represent this Company in London.

Mr. Duggan was interested in all kinds of sports, but was best known in connection with yachting, where he had attained a reputation both as a designer and racing skipper—having won a number of races with his own designs. He won a good many important races on Sydney Harbour, on Lake St. Louis and an International Cup at Alexandria Bay in 1913.

Before leaving for England he had several times attempted to enlist in the Princess Patricias, but had been rejected on account of a slightly strained heart. After a short time in England he was offered a Commission in the Royal Engineers, and as he spoke French and German fluently, the medical examination was possibly somewhat relaxed. He completed his military training in an exceptionally short time and was sent to France with the 70th Field Company early in May, 1915. On the night of the 18th October he was sent with a company of Sappers to consolidate a trench then being attacked on the north of the Hulloch Quarries. The bombing party lost its Officers and were driven back on the Sappers, when Lieut. Duggan took charge of the attack and carried it out successfully. He received a slight wound in this attack but refused to retire and was given charge of the party. Later in the same night, one of the Infantry Officers who had gone out to bring in some advanced Bombers, did not return, and Lieut. Duggan

went out to bring him back. He was severely wounded in this attempt and was taken to Bethune, where he died two days later, October 21st, 1915.

HELLIWELL, JOSEPH GRANT (Capt.), Junior Can.Soc.C.E., was born in Toronto 26th November, 1888. He graduated from the University of Toronto with the degree of B.A.Sc., in 1910. After graduation he was for a time with the Toronto Branch of the Trussed Concrete Steel Co. He left this company to take a position on the engineering staff of the City of Toronto. He was later employed by the Canadian Bridge Company at Walkerville, Ont., where he remained for almost three years until the outbreak of the war in August, 1914.

While at College he was connected with the Engineers' Corps, and on removing to Windsor joined the Essex Fusileers. While living in Windsor, he took a course of military instruction and was gazetted Captain in 1913. Captain Helliwell was one of the first officers of his district to volunteer for active service.

He was killed in action near Givenchy, France, on 15th June, 1915.

ROSHER, JOHN HENRY, Junior Can.Soc.C.E., was born at London, Eng., 12th June, 1890. He was educated in England and after coming to Canada was employed by the Canadian Pacific Railway from 1910 to 1914 successively as rodman, leveller, transitman and acting Assistant Engineer on the Irrigation project near Calgary.

Mr. Rosher enlisted with the Princess Patricias in August, 1914, and left with the First Contingent. He was killed in action on 20th March, 1915.

DOMBROWSKI, PHILIPPE, S.Can.Soc.C.E., was born at Quebec, 3rd August, 1890. He was educated at the Ecole Polytechnique, Montreal.

He was accidentally drowned at Quebec in 1915.

FYSHE, FRANCIS (Lieut.), S.Can.Soc.C.E., was born at Halifax, 7th December, 1894. He graduated from the Royal Military College in June, 1914. Lieut. Fyshe joined Col. Creelman's Battery shortly after war was declared.

He was killed in action on 27th November, 1915.

DISCUSSION ON THE REPORT OF COUNCIL, THE REPORT OF THE
LIBRARY AND HOUSE COMMITTEE AND THE FINANCIAL
STATEMENT.

The Report of Council was, on motion by Prof. W. Muir Edwards, seconded by Mr. G. A. Mountain, received. After discussion, Mr. Wm. McNab moved, seconded by Mr. G. A. Mountain, that the Report be adopted. Carried.

The Report of the Library Committee was, on motion by Mr. J. M. R. Fairbairn, seconded by Mr. R. M. Hannaford, received and adopted.

The Treasurer's statement, on motion by Mr. E. Marceau, seconded by Mr. C. H. Keefer, was received.

Mr. E. W. Oliver moved, seconded by Mr. W. J. Francis, "That in view of the Treasurer's Report and the Report of the Finance Committee being so interlaced the two be considered as one." Carried.

Mr. R. A. Ross, as Chairman of the Finance Committee, presented the following Report of the Finance Committee:—

January 10th, 1916.

REPORT OF THE FINANCE COMMITTEE.

After a detailed study of the financial condition of the Society, your Finance Committee, consisting of the following:—

H. H. Vaughan,
G. H. Duggan,
C. N. Monsarrat,
E. Marceau,
R. A. Ross,

desires to call attention to the serious position in which we are placed on account of the existing state of war, with consequent absence of members at the front and the falling off of new membership because of conditions in engineering generally throughout the country. The result being a serious reduction in receipts for the next year and probably the following years.

In order to present this matter properly, your Committee has condensed in the table herewith the Treasurer's Reports of the Society covering receipts and expenditures, beginning with the year 1907 up to and including the year 1915.

In order to be able to suggest a budget to govern expenditure for 1916, careful estimates have been made of the probable membership and revenues for that year, and with the assistance of the Library and House Committee, the Committee on Papers and Meetings, the Committee on Publications, and the Secretary, a budget of expenditure for 1916 is submitted for your consideration, attention being called to the following points:—

1st. **ARREARS.**—During the year 1915 a special effort resulted in the collection of arrears to the extent of \$6,733.00. As this has largely cleared the back dues possible of collection, it is not anticipated that more than \$2,000.00 can be collected during 1916.

2nd. **CURRENT FEES.**—Due very largely to the absence at the front of over 340 members, payment of whose fees are excused there will be an increased shrinkage in this item during 1916, though to a smaller degree than in the previous year.

3rd. **ENTRANCE FEES.**—Owing to the existing conditions in engineering a large proportionate decrease is anticipated in this item, and is reflected in the budget for 1916.

4th. **TOTAL.**—The results of the above are that whereas the revenue for 1915 was \$22,080.00, that for 1916, due to the above causes, is expected to be in the neighbourhood of \$15,000.00, indicating a shrinkage in revenue of about \$7,000.00, due to causes over which the Society has no control.

In order that the Society may be able to liquidate its yearly obligations in view of the above shrinkage, it will be necessary to do one of the following: 1st. Borrow such moneys as may be required to carry on the operations of the Society on the same scale as during the past. 2nd. To levy an extra yearly contribution of about \$2.50 per member on the average. 3rd. To dimension our garment according to the cloth we have, by a reduction in expenditures, even perhaps to the detriment of some of the activities of the Society.

The first measure of relief indicated above does not appear sound, for it must be anticipated that deficits may occur in the following years and the charging of such cumulative operating deficits to capital account would be suicidal.

With regard to the second method great difficulties would probably arise in collecting an additional yearly fee, so that we recommend your consideration of the programme outlined below for a reduction in expenditures.

In order to ascertain whether the work of the Society can be carried on under the reduced expenditures indicated, your Committee associated with itself the Committees on Library and House, Papers and Meetings and on Publications, and enlisted the services of the Secretary, so that the budget suggested in the last column of expenditure is one which has been carefully studied by those responsible therefor. The results indicate that it will be possible to keep within the anticipated revenues, or at least very close thereto, only if a vigorous policy for the acquisition of new membership be initiated.

Bearing upon the above statement we have several comments to make:—

1st. During the year of 1914, under the heading of PRINTING AND STATIONERY, a certain amount therein charged is properly attributable to the previous year's commitments.

2nd. During the year 1914 there occurs the first deficit, due largely to the printing charged to that year.

The Spending Committee, in their Report upon the Budget for 1916, call attention to the following:—

(1) Interest payments, being a fixed charge, cannot be reduced.

(2) Printing and Stationery: By a careful selection of papers for publication, reduction of size of Annual Report and reduction of advance proofs and other small items of cost, will, it is anticipated, result in a saving of about \$2,000.00.

(3) Salaries and Wages: Owing to the reduction of about \$750.00 made during the previous year, these can be reduced further only with difficulty, but the matter will receive careful attention when the new Council takes up its duties. In this connection, to remedy a widespread misapprehension, it may be stated that the salary of the Secretary is \$1,800.00 per year.

(4) Taxes and Water: An effort made last year to have the Society freed from taxes, as being an educational body, failed; but a renewed attempt in a different direction may have better results and will be tried. The prospects, however, do not warrant a reduction in the suggested budget.

(5) General Expenses have been cut by nearly \$1,000.00 as a war measure by a careful pruning of general items of expenditure too numerous to detail separately. It may be mentioned, however, that the item of postage has been increased recently by about

\$1,000.00, owing to the cancellation of our franking privilege on Transactions.

(6) Branch Societies: An automatic reduction in this item of about \$266.00 is anticipated, owing to a reduction of rebates due to the absence of members at the front.

SUMMING UP.—Your Committee finds, as a result of its study of expenditures, outlined above, and with the reduced paying membership and decrease in new members which is anticipated, the results for 1916 will still show an operating deficit of about \$1,633.00.

The remedy recommended by your Committee for the above condition is the prosecution of a campaign of recruiting to bring our depleted ranks up to full strength as before the war. We understand that a Committee has been formed for this purpose, to which the membership at large should give their individual assistance by an active canvass of suitable candidates for membership.

Respectfully submitted,

R. A. ROSS,

Chairman, Finance Committee.

Mr. Ross explained the various items of the Report at length.

In the discussion of this report, Mr. W. J. Francis placed before the meeting a comparative statement as to the income and expenditure in this Society and in the Engineering Societies of the United States. The following is an abstract of the statement:—

Comparison of Income and Expenditure of the Canadian Society of Civil Engineers with *average* expenditure of the four National Societies of the United States of America for the year 1915.

Items	American Societies	Canadian Societies
Membership - - - -	6,900	3,060
EXPENDITURE—		
Printing cost - - - -	\$49,480	\$5,970
do. per member - -	7.17	1.95
Postage - - - -	7,988	1,887
do. per member - -	1.15	0.62
Clerical staff - - - -	29,710	3,768
do. per member - -	4.31	1.23
TOTAL DISBURSEMENTS - - - -	\$128,840	\$19,775
do. per member - -	18.67	6.46
INCOME - - - -	144,045	22,079
do. per member - -	20.87	7.20

These figures show that the work of this Society has been conducted at a cost per member of just one-third that of the American Societies. For printing, this Society pays 25 per cent., for postage, 58 per cent., and for office staff 29 per cent. of the similar charges, per member, in the American Societies.

In order to obtain another point of view, Mr. Francis also placed before the meeting a statement of the income and expenditure of the American Society of Civil Engineers at a time in its

history (1903-1904) when its membership corresponded numerically with that of our own Society at the present date. The following is an extract from the table presented:—

- Comparison of Income and Expenditure of the Canadian Society of Civil Engineers in 1915 with the *average* income and expenditure of the American Society of Civil Engineers during the years 1903 and 1904.

ITEMS.	RECEIPTS.	
	American Society.	Canadian Society.
Membership	3,063	3,060
Current Fees	\$34,307.00	\$12,438.00
Per Member	11.20	4.06
Advance Fees	14,960.00	139.00
Per Member	4.88	.04
Entrance Fees	7,650.00	2,233.00
Per Member	2.49	.73
Arrears	1,201.00	6,733.00
Per Member .....	.39	2.20
Other Receipts	9,051.00	537.00
Per Member	2.95	.17
TOTAL INCOME	\$67,169.00	\$22,080.00
PER MEMBER	21.93	7.21
EXPENDITURE.		
Clerical Staff	\$12,045.00	\$ 3,768.00
Per Member	3.93	1.23
Printing	15,990.00	5,970.00
Per Member	5.22	1.95
Postage	3,489.00	1,887.00
Per Member	1.15	.61
Interest	4,167.00	1,200.00
Per Member	1.36	.39
Other Expenditures	4,731.00	3,544.00
Per Member	1.54	1.15
TOTAL EXPENDITURE	\$40,422.00	\$16,369.00
PER MEMBER	13.20	5.35

Mr. Francis dwelt at some length on a comparison of the various items exhibited by the foregoing statement. He referred especially to the fact that the table shows the income of the American Society from current fees to have been at this stage of its life \$11.20 per member, while ours is now but \$4.06, a ratio of nearly 3 to 1. The difference is, of course, due to the larger scale of dues paid by the American Society members. It is thus seen that we are trying to do a whole lot of work for nothing.

Many of the members present complimented the Finance Committee on the excellent work they had done under the difficult conditions which existed during the past year.

In reply to a question, the Secretary stated that notwithstanding the large amount of arrears collected during the year the total unpaid dues on January 1st still amounted to some \$18,000, the shortage on collections for 1915 offsetting payments for previous years.

On motion by Mr. R. A. Ross, seconded by Mr. A. Surveyer the statement of the Finance Committee and the report of the Treasurer were adopted.

The Secretary announced that the first order of business in the afternoon would be the consideration of a resolution on Society affairs to be introduced by Mr. E. W. Oliver.

The session then adjourned.

AFTERNOON SESSION, JANUARY 25TH, 1916,

The meeting reassembled at 3 p.m., Mr. F. C. Gamble, President, presiding.

Mr. E. W. Oliver opened a discussion on Society affairs and proposed a resolution in connection therewith.

A lengthy discussion followed, which was taken part in by Messrs. J. A. Jamieson, G. R. G. Conway, H. E. T. Haultain, W. Muir Edwards, H. R. Safford, C. H. Keefer, R. F. Uniacke and others.

Mr. Oliver withdrew his resolution, for the time being, and on motion by Mr. S. P. Brown, seconded by Mr. R. F. Uniacke, it was resolved—

“That a Committee be appointed from this meeting, consisting of Messrs. Oliver, Conway and Jamieson, with power to add to their number, to draft a joint resolution on the subject of possible reorganization of Society affairs to be presented to this meeting for consideration to-morrow at 3 o'clock.”

REPORTS OF BRANCHES.

The President called the attention of the meeting to the reports from Branches, and asked that they be accepted as read.

REPORT OF THE VICTORIA BRANCH.

To the President and Council:—

On behalf of the Victoria Branch we herewith submit our Annual Report for the year 1915.

The Annual Meeting was held on December 8th, and the following officers were elected by ballot, viz.:—

Chairman—H. W. E. Canavan.

Vice-Chairman—H. A. Elgee.

Treasurer—E. Davis.

Secretary—R. W. Macintyre.

A. E. Foreman.

E. G. Marriott.

Past Chairmen (who are ex-officio members)—F. C. Gamble and D. O. Lewis.

Auditors—H. A. Icke and R. H. Addison.

Twelve Branch Meetings were held during the year with an average attendance of 13.6.

The following papers were read before the Branch:—

(1) Obstructions in the Fraser River affecting the salmon industry—Messrs. Napier & McHugh.

(2) Canadian Northern Pacific Railway location—D. O. Lewis.

(3) Jordan River Power Development, Vancouver Island—C. A. Lee.

(4) The incidence of Precipitation and Temperature to river discharge in Western Canada—J. M. Case.

(5) Public Works in the North West Territories (Alberta and Saskatchewan)—R. W. Macintyre.

Fourteen applications were received for admission as Branch Associates, of whom thirteen were elected, and one Junior affiliated with the Branch during the year.

One Member, and five Associate Members, left the Province and one Junior resigned, whilst of our Branch Associates five removed from the city and three were suspended, making a total of fifteen.

Transfers—One Junior and One Student were transferred to the rank of Associate Members, and eight Branch Associates were elected to the Parent Society, leaving the present strength of the Branch as follows:—

Honorary Members	1
Members	23
Associate Members	33
Juniors	7
Students	1
Branch Associates	14
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Total	79
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which shows a decrease of two when compared with last year's total of 81.

Eleven members of the Branch have joined the Overseas Forces during the year, including 1 Member, 4 Associate Members, 3 Juniors and 3 Branch Associates, in addition to the eight who joined during 1914, making a total of 19, or about 25 per cent. of our membership. Two other members (A.M.) are now in England with the object of going to the front.

Eight receptions were held during the winter months, with a good attendance of members and ladies.

The Fourth Annual Convention of British Columbia members was held in Vancouver on December 10th, military service being responsible for a small attendance, as compared with former years.

Owing to the formation of a Provincial Division for British Columbia it was decided to incorporate the Convention proceedings with those of the Provincial Division, which is a nominal change only, i.e., that of name, as all past Conventions have been Provincial gatherings of the British Columbia members.

The proceedings of this meeting are being forwarded separately by the Secretary of the Provincial Division.

A detailed statement of Members' addresses, resignations, removals, and names of those who have joined the C.E.F. is attached.

Respectfully submitted,

H. W. E. CANAVAN, Chairman.

R. W. Macintyre, Secretary.

Moved by Mr. D. O. Lewis, seconded by Mr. W. F. Tye, that the report of the Victoria Branch be accepted. Carried.

REPORT OF THE VANCOUVER BRANCH.

The President, Council and Members,
Canadian Society of Civil Engineers,
Montreal, Canada.

Dear Sirs,—

On behalf of the Vancouver Branch we have pleasure in submitting our report for the year 1915.

The present membership of the Branch is One Hundred and Nineteen, distributed as follows:—

Members	38
Associate Members	63
Juniors	10
Students	8

Our Branch has five Members, fourteen Associate Members, two Juniors and three Students on Active Service.

Lieutenant Duncan Peter Bell-Irving, Junior Member, was killed in battle in the early part of this year.

We also regret having to record the deaths during this year of Mr. Walter Moberly, an Honorary Member of our Branch, and Mr. Harry B. Abbot, M.Can.Soc.C.E.

Thirteen meetings were held during the year, and the following papers, most of them illustrated with lantern slides, were presented:—

- Jan. 7. Vancouver Joint Sewerage Scheme, by A. D. Creer, M.Can.Soc.C.E.
- Jan. 21. Street Railway Track Construction, by H. J. Tippet, Jun.Can.Soc.C.E.
- Feb. 4. Ancient and Modern Gas Manufacture, by Mr. R. W. Ford.
- Feb. 18. Discussion, "Relation of the Engineer and the Contractor, Contracts and Specifications."
- Mar. 4. The Vancouver Terminals of the C.P.R., by Mr. H. Rindal.
- Mar. 18. The Kingsway Paving, by F. L. Macpherson, M.Can.Soc.C.E.
- April 1. Docks and Harbours, by Mr. J. McLachlan.
- April 15. Remedial Works on the Fraser River, by Messrs. Napier and McHugh.
- June 3. Annual Meeting.

- July 16. Meeting called to select Committee to proceed with the work of forming a Provincial Division.
- Oct. 28. First Meeting of the Winter Session, addressed by the Chairman, Mr. R. F. Hayward, M.Can.Soc.C.E., on The Mexican Light & Power Co.'s Plant.
- Nov. 18. Military Sketching and Reconnaissance, by Lieutenant Tweedale.
- Dec. 2. Bridges and Foundations Extraordinary, by C. E. Fowler, M.Am.Soc.C.E.

At the Annual Meeting on June 3rd, the following officers were elected to hold office for the season 1915-16:—

Chairman—R. F. Hayward, M.Can.Soc.C.E.

Vice-Chairman—H. E. C. Carry, M.Can.Soc.C.E.

Executive—D. Cameron, M.Can.Soc.C.E.,
 C. E. Cartwright, M.Can.Soc.C.E.,
 A. G. Dalzell, M.Can.Soc.C.E.,
 E. G. Matheson, M.Can.Soc.C.E.,

Secretary-Treasurer—A. K. Robertson, M.Can.Soc.C.E.

Auditors—H. P. Archibald, A.M.Can.Soc.C.E.,
 B. R. Warden, M.Can.Soc.C.E.

On October 28th, F. O. Mills, A.M.Can.Soc.C.E., was appointed Assistant Secretary, as Mr. A. K. Robertson's military duties took him from the city a greater portion of his time.

The principal Engineering Magazines are kept on file in the library and reading room of the Branch, 1017 Metropolitan Building, for the use of the members.

Respectfully submitted,

R. F. HAYWARD, Chairman.

ALEN K. ROBERTSON, Secretary-Treasurer.

Moved by Mr. G. R. G. Conway, seconded by Mr. A. A. Dion, that the report of the Vancouver Branch be adopted as presented. Carried.

REPORT OF THE CALGARY BRANCH.

To the President, Council and Members of the Canadian Society of Civil Engineers.

Gentlemen,—On behalf of the Calgary Branch of the Canadian Society of Civil Engineers we beg to submit the following report

of the Calgary Branch of the Canadian Society of Civil Engineers for the year 1915:—

During the past year there have been nine general business meetings of the Members of the Branch, including the Annual Meeting in December.

The Executive Committee held twelve business meetings and the Committee on Credentials and Applications held three business meetings. In addition to this there were informal meetings of certain members of the Branch to arrange for the entertainment of a party of Engineers who visited Calgary on October 4th.

Seven suppers were given by the Branch, with speakers as follows:—

DATE.	NAME OF SPEAKER.	SUBJECT.
Dec. 30, 1914.	A. H. Clarke, K.C., M.P.	"Drainage Laws."
Jan. 15, 1915.	F. L. Haszard, M.D.....	"Camp Sanitation."
Jan. 29, 1915.	George Romanes, B.Sc...	"Problems and Practice of Municipal Engineering in Calgary."
Feb. 19, 1915.	Prof. W. Muir Edwards, M.Sc.	"The Engineer and his undeveloped possibilities."
Mar. 9, 1915.	Colonel E. A. Cruickshank	"The German Theory of War."
Mar. 26, 1915.	Norman S. Rankin	"The Panama Canal and Exposition."
Apr. 9, 1915.	Wm. Murdock	"Engineering Problems in St. John, N.B."

In addition to this a luncheon was given previous to the Annual Meeting in December at the Palliser Hotel, and on October 4th, a party of Engineers returning from the International Engineering Congress at San Francisco, Cal., U.S.A., were given a drive about the city in the forenoon, a luncheon at the Palliser Hotel at noon and a supper at the Hunter Hotel at Bassano in the evening.

A. C. D. Rath and E. N. Ridley attended the Convention of the Western Canada Irrigation Association at Bassano, Alberta, on November 23rd, 24th and 25th, as delegates for the Parent Society, and P. J. Jennings and G. N. Houston attended as delegates for this Branch.

A statement of the finances of the Branch on November 30th, 1915, shows a balance of \$365.95 in the Bank.

The present membership of the Branch is sixty seven, distributed as follows:—

Members	17
Associate Members	34
Juniors	4
Students	4
Associates of Branch	8

67

Eight of our membership have enlisted for overseas service.

We regret to have to report John H. Rosher, Junior, killed in action "Somewhere in France" in March, 1915.

We feel that the Branch has advanced materially during the past year, and that it is exerting an influence in the community. The fact that the City Council gave us a grant for use in entertaining a party of Engineers who visited the city and accepted our offer to investigate and report on the technical matters referred to in Alderman Fawkes' charges regarding the Centre Street Bridge, are evidences of the official recognition which we have received.

The Annual Meeting was held December 4th, 1915, and the following officers were elected for the ensuing year:—

Chairman—William Pearce.

Secretary-Treasurer—Sam G. Porter.

Executive Committee—P. J. Jennings,

A. S. Dawson,

H. Sidenius,

H. B. Muckleston,

F. H. Peters,

} Ex-officio.

Auditors—J. S. Tempest,

S. K. Pearce.

An amendment to our By-Laws providing that the last two surviving Past-Chairmen shall be ex-officio members of the Executive Committee went into effect December 31st, 1915.

Respectfully submitted,

WM. PEARCE, Chairman.

SAM G. PORTER, Secretary-Treasurer.

Moved by Mr. W. M. Edwards, seconded by Mr. J. Duchastel, that the report of the Calgary Branch be adopted as presented. Carried.

REPORT OF THE EDMONTON BRANCH.

The President and Members of the Canadian Society of Civil Engineers:—

Gentlemen,—The Executive of the Edmonton Branch begs to submit herewith the annual report covering the activities of the Branch for the year 1915.

The Membership of the Branch at the present time is as follows:—

Members	8
Associates	1
Associate Members	24
Juniors	7
Students	3
Branch Associates	7
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Total	50

The following papers have been read before the Branch:—

“Military Engineering,” by D. Donaldson.

“Standardization as Applied to City Utilitles,” by A. J. Latornell.

“The Construction and Operation of Electric Street Railways,” by J. H. Larmonth.

“A Mining Trip to Prince William Sound, Alaska, in the Early Stage of its Development,” by W. T. Ferrier.

These papers were illustrated by lantern projections which added greatly to their interest.

The Branch also spent several evenings visiting Engineering works of interest in the city, including the following:—

The City Power Plant.

The Electric Street Railway Car Barns.

The City Telephone Exchange.

The Superintendent of each City Utility personally conducted the Engineers during the visit.

At the General Meeting for the election of Officers, which was held on May 19th, 1915, the following Officers were elected for the ensuing season:—

Chairman—A. T. Fraser.

Vice-Chairman—A. J. Latornell.

Secretary-Treasurer—L. B. Elliot.

These Officers, with the following Members, constitute the Executive Committee of our Branch:—

J. Chalmers,
J. L. Coté, M.L.A.,
C. A. Robb,
W. R. Smith.

As the Vice-Chairman, A. J. Latornell, has been absent several months, J. L. Coté was appointed to act during his absence.

The newly elected Officers were installed at the Annual Meeting, which was held on October 18th last. At this meeting the Secretary-Treasurer's and the Auditor's report for the Branch year were read and adopted.

With the opening of the season of 1915-1916 the Branch felt that it would add to the general interest to have more informal discussions on important Engineering problems of the day, particularly those affecting the West. Following this policy we had recently an interesting discussion on "Spur Track Regulations in the City of Edmonton." At the last regular meeting of the Branch we were favoured with an interesting address on the Provincial Highways by the Hon. Charles Stewart, Minister of Public Works in the Alberta Government.

Through the kindness of the President of the University of Alberta, the Branch has been allowed the privilege of having its regular meetings in the University. Further, the Branch Members have the opportunity of obtaining books from the University Library on the same basis as the Students.

The Edmonton Branch has taken a keen interest in Society affairs, particularly with reference to Western matters. We have had considerable exchange of views with the other Western Branches, in an effort to secure united action in our endeavours.

Respectfully submitted,

A. T. FRASER, Chairman.

L. B. ELLIOT, Secretary-Treasurer.

Moved by Mr. W. M. Edwards, seconded by Dr. L. A. Herdt, that the report of the Edmonton Branch be adopted as presented. Carried.

REPORT OF THE REGINA BRANCH.

The Regina Branch of the Canadian Society is just concluding the initial year of its existence. Just about a year ago the first meeting was held, at which the establishment of this Branch was decided upon, and the Parent Society notified to this effect. Right from the start the Regina Branch endeavoured to arrive at some understanding with the "Regina Engineering Society," in order to have as close a co-operation as possible between the two societies, the local field being too small for two independent bodies with the same aims.

After several General and Executive Meetings of both Societies it was decided unanimously to hold joint meetings every first Thursday of the month, the conduct of the meeting to be vested alternately in each Society. At the date of this report there have been three meetings held jointly, one of them by the Regina Branch of the Canadian Society, at which a paper was read by the Chairman of the Branch, Mr. O. W. Smith, on the subject of "Specifications," dealing very thoroughly with the advantages and disadvantages of the various clauses in General and Special Specifications from a Contractor's point of view.

Besides this joint meeting there have been five Executive and three General Meetings held by the Regina Branch during the past year, mostly for organization purposes, considering and deciding upon By-Laws, etc. The trying period of organization being concluded, the Branch looks upon the coming year to further develop a feeling of professional fraternity amongst its members and to increase the usefulness and the prestige of the Canadian Society of Civil Engineers.

The Branch enters upon the second year of its existence with 4 Members, 18 Associate Members, 1 Junior and 2 Student Members, of which total number eight are on Active Service.

The Officers elected for the ensuing year are as follows:—

Chairman—O. W. Smith.

Vice-Chairman—L. A. Thornton.

Secretary-Treasurer—J. N. deStein.

Members of Executive Committee—J. A. McPherson, R. J. Lecky.

The Branch not having received any refund from the Parent Society, is not making a financial statement.

O. W. SMITH, Chairman.

J. N. DESTEIN, Secretary-Treasurer.

Moved by Mr. W. J. Francis, seconded by Mr. S. P. Brown, that the report of the Regina Branch be adopted as presented. Carried.

REPORT OF THE MANITOBA BRANCH.

On behalf of the Manitoba Branch we take pleasure in submitting the following report for the year 1915:—

Officers for the season, May, 1915, to May, 1916, are as follows:—

Chairman—W. G. Chace.

Executive Committee—W. A. Duff,
E. P. Fetherstonhaugh,
Frank Lee.

Secretary-Treasurer—A. W. Smith.

Auditors—W. L. MacKenzie,
B. S. McKenzie.

Seven regular meetings of the Branch were held at which the following papers were read and discussed:—

- Jan. 7, 1915. "Naval Ordnance and Gunnery," by John Sweeney.
- Feb. 4, 1915. "Lethbridge Sewage Disposal Works," by A. C. D. Blanchard.
- Mar. 4, 1915. "Winnipeg's Well System of Water Supply," by W. P. Brereton.
- Sept. 9, 1915. "Steam Power Plants at Divisional Points on the Grand Trunk Pacific Railway," by H. Lorimer.
- Oct. 14, 1915. "Something About Projectiles," by T. R. Deacon.
- Nov. 4, 1915. "Righting of the Transcona Elevator," by Frank Lee.
- Dec. 9, 1915. "Grade Separation in the City of Winnipeg," by W. P. Brereton.

The average attendance at these meetings was forty.

Six meetings of the Electrical Section were held at which the following papers were read and discussed:—

- Jan. 18, 1915. "Automatic Lighting Plants," by Leonard Andrews.
- Feb. 15, 1915. "The Community of Interests Between the Public and the Service Corporation," by J. G. Glassco.
- Mar. 8, 1915. "High Tension Transmission," by T. Phillips.

- Oct. 13, 1915. "Electric Signal System as a Factor in Fire Protection," by F. A. Cambridge.
- Nov. 10, 1915. "Wireless Telephony," by J. M. F. Wilson.
- Dec. 8, 1915. "Application of Curves, Charts and Graphs to the Analysis of Engineering Problems," by F. H. Martin.

The average attendance at these meetings was thirty-three.

Six meetings of the Mechanical Section were held at which the following papers were read and discussed:—

- Jan., 1915. "Compressed Air," by E. T. Spidy.
- Feb., 1915. "The Measurement of Air and Other Gases, Including a Description of the Thomas Electric Gas Meter," by Prof. W. C. Rowse.
- Mar., 1915. "Gas Engines," by Prof. W. J. Gilmour.
- May, 1915. "Oils, Their Manufacture and Distillation," by L. A. Warren.
- Oct., 1915. "Relation Between Production and Costs," by H. L. Gantt.
(This is a paper Mr. Gantt read before the American Society of Mechanical Engineers.)
- Dec., 1915. "Reinforced Concrete, Its Evolution, Advantages and Disadvantages in Construction," by M. T. Cantell.

The average attendance at these meetings was fifteen.

The present membership of the Branch is distributed as follows:—

Members	36
Associate Members	75
Associates	1
Juniors	20
Students	28
Local Associates	58
<hr/>	
Total	218

Twenty-seven members have enlisted for Active Service and are now either at the front or in training.

The first volume of Transactions of the Branch, including papers read in 1914-15, was printed this year and distributed to the members.

A registration list of unemployed members has been started, by which it is hoped Engineers out of work may be brought in touch with those requiring their services.

The Annual Meeting of the Branch was held on December 9th, 1915, at which the following Officers were elected for the season 1916-17:—

Chairman—Frank Lee.

Executive Committee—A. H. Aldinger,
J. A. Douglas,
J. C. Holden.

Secretary-Treasurer—A. W. Smith.

Auditors—W. L. MacKenzie,
B. S. McKenzie.

The Treasurer's report presented at the Annual Meeting of the Branch showed a credit balance of \$721.21.

Respectfully submitted,

W. G. CHACE, Chairman.

A. W. SMITH, Secretary-Treasurer.

Moved by Mr. B. S. McKenzie, seconded by Mr. Wm. McNab, that the report of the Manitoba Branch be adopted as presented. Carried.

REPORT OF THE OTTAWA BRANCH.

To the President and Members of the Canadian Society of Civil Engineers.

Gentlemen,—On behalf of the Managing Committee of the Ottawa Branch, we beg to submit the following report for the calendar year 1915:—

The annual meeting of the Branch was held on the 14th of October; the following officers were elected:—

Chairman—John Murphy.

Secretary-Treasurer—J. B. Challies.

Managing Committee—R. deB. Corriveau,
A. Gray,
W. S. Lawson,
A. T. Phillips,
G. G. Gale.

The Managing Committee selected the following standing committees:—

Entertainment—Alex. Gray, Chairman; G. G. Gale, J. H. McLaren.

Papers—W. S. Lawson, Chairman; A. T. Phillips, J. B. Challies.

Rooms and Library—R. deB. Corriveau, Chairman; W. F. M. Bryce, G. B. Dodge, B. E. Norrish, (Librarian).

Membership—A. B. Lambe, Chairman; J. A. Robert, E. B. Jost, G. B. Dodge, W. F. M. Bryce.

The Branch membership figures for 1913-14-15 are given hereunder:—

	1913.	1914.	1915.
Honorary Members	3	3	1
Members	51	46	51
Associate Members	116	113	124
Associates	1	1	1
Juniors	15	28	33
Students	28	16	27
Ottawa Associates	24	21	17
Total	238	228	254

As may be noted, many changes have taken place. Two of our most prominent members, Sir Sandford Fleming and T. C. Keefer, C.M.G., both Honorary Members of the Society, died during the year. We also report the death of Mr. T. C. Campbell and A. T. Genest, the former while on active service at the Dardanelles.

An analysis of the changes in our membership indicates a very satisfactory readjustment of classification, by transfers from low to higher grades. The question of transfers, especially from the Student class, is now receiving the attention of a special committee on Membership.

A large proportion, about 10 per cent., of our total membership, has enlisted for overseas service. The following is as complete a list as can be secured of all members now on active service:—

A. A. Anderson,	T. V. Anderson,
E. F. Brown,	W. E. Blue,
F. L. Delaute,	J. L. H. Bogart,
H. H. Donnelly,	H. W. Tate,
A. W. Gregory,	R. L. Junkin,

G. F. Gervan,	T. C. Keefer, Jr.,
R. W. Guy,	A. P. Deroche,
J. C. Galway,	G. H. Ferguson,
J. H. Ramsay,	R. S. Stronach,
R. W. Powell,	J. P. McRae,
S. D. Parker,	H. Brunlees,
J. C. Stewart,	H. A. Dupre,
A. Nowlan,	A. Dale Harris,
F. O. Hodgins,	J. H. Munro,
C. N. D. Otty,	A. Theriault.
D. A. White,	

The Branch has been endeavouring to include the military engineers in training at the Engineering Depot at Ottawa in all its activities.

Two very important amendments have been recommended by the Managing Committee, and these have been approved by letter ballot by the membership.

The first amendment provides for the enlargement of our Managing Committee to include the past-chairman, the past-secretary and the sitting members of Council resident within our jurisdiction for one year only, following their term of office. This will undoubtedly be in the best interest of the Society as it not only furnishes the Branch with the right to the benefit of their advice and assistance, which these officers in question have always generously given, but also affords the Branch a direct, close and continuous connection with the Council of the main Society.

The second amendment affects the fiscal year of our Branch which has, from its inception, been from October to October. This arrangement, with a consequent change of officers at a time which does not coincide with the main Society's fiscal year, has made it difficult for us to make a satisfactory and complete annual report to the main Society. Acting upon a recommendation of the retiring officers, our official year has been made the calendar year.

Our Papers and Entertainment Committees have been very successful in securing a number of prominent speakers on subjects of great interest to the engineering profession and to the general public. The attendance, especially at open meetings, has been unusually large. The following is a list of the meetings held during the year 1915:—

“Town-Planning and its Relation to the Engineer”—Thos. Adams.

"Grain Elevators and their Construction"—James Spelman, M.Can.Soc.C.E.

"Economic Conditions Governing Transportation in Canada"—W. Sandford Evans.

"Slow Sand Filtration of Water Supplies"—Joseph Race.

"A New Country Club"—W. T. Macoun.

"The Seizure of German Trade"—Dr. James Bonar.

"Economics of Engineering Problems"—W. Sandford Evans.

"Railroad Construction and the Public"—H. A. Powell, K.C.

"The Ethics of Engineering"—Hon. Sir George Foster.

"A Trip to the Panama Pacific International Exposition"—John Murphy, M.Can.Soc.C.E., Fel. A.I.E.E.

"Aviation"—J. A. D. McCurdy.

"Munitions"—Sir Alex. Bertram, M.Can.Soc.C.E.

"Difficult Foundations in Mexico"—S. J. Fortin, M.Can.Soc.C.E.

The Normal School auditorium, the Board room of the Commission of Conservation, and the Ottawa Public (Carnegie) Library hall, have been courteously placed at our service for open meetings by the officials in charge of them.

A small proportion only of the papers and addresses were contributed by members of the Society. It is considered desirable that men who are not engineers should often be induced to address the Branch on topics of general interest. It is, at the same time, considered equally important for the profession, that our own members should be induced to relate their experiences in connection with special engineering works on which they have been engaged, and share with their fellow members the practical knowledge which they have acquired while overcoming engineering difficulties met with in the construction of works, and, incidentally, in the handling

The Branch has not indulged in any form of "entertainment" during the year. The Entertainment Committee's efforts have been devoted to securing after-luncheon speakers and to co-operation with the Papers Committee.

We are still without permanent rooms for Branch headquarters, and, in view of the necessity for stringent economy, it is not probable we shall make any definite arrangements towards permanent quarters at present, but through the courtesy of the gentlemen above referred to, suitable meeting places have always been provided.

While it is felt that the lack of suitable headquarters for the Branch is a great drawback, special and successful efforts have

been made to keep up the interest of our members by arranging for attractive and interesting evening and mid-day meetings; the chief feature of the latter is always a short address by a prominent resident of or visitor to the Capital.

The Branch has endeavoured to effect every possible economy. Our finances are still low, but continue to improve slightly, and it is hoped that before the end of 1916 the Branch will be able, notwithstanding the present circumstances, to report an even more satisfactory financial condition.

JOHN MURPHY, Chairman.

J. B. CHALLIES, Secretary-Treasurer.

Moved by Mr. J. B. Challies, seconded by Mr. A. A. Dion, that the report of the Ottawa Branch be adopted as presented. Carried.

REPORT OF THE TORONTO BRANCH.

The interest shown by the Members of the Branch and also by the Engineering Students of the University of Toronto was exceedingly gratifying, and the Executive Committee feel that some progress has been made notwithstanding the cloud overhanging us all.

A membership campaign has been quietly carried on with some degree of success, as the following table will show:—

	1914.	1915.
Members	45	48
Associate Members	106	119
Associates	8	8
Juniors	33	36
Students	103	133
	<hr/>	<hr/>
	295	344

This shows an increase of 49 members, or 17% over the previous year.

Three members, fifteen associate members and about seventy-five students have gone to serve the colours.

The Executive felt that something should be done to increase the interest in the Society, as well as to promote the welfare of the members, and with this in view, we took preliminary steps towards

establishing a working organization that would stimulate discussion and research. Standing Committees were formed covering the various branches of the profession. These Committees have presented reports, copies of which have been forwarded to the parent Society and are appended hereto. During the coming year, this organization will be perfected and we look forward for promising results.

Eight meetings were held and one trip taken during the year as follows:—

Thursday, February 25th, 1915.—Address, illustrated with motion pictures and lantern slides. Speaker, Mr. W. McNab. Subject, "Construction of the Grand Trunk Pacific Railway." Held in Chemistry and Mining Building, University of Toronto. Number present, 172. The Branch also formed a Committee at this meeting to report to the Ontario Government, at their request, on drainage of farm lands.

Thursday, March 25th, 1915.—Luncheon at Dunning's Restaurant. Speaker, Mr. T. T. Black. Subject, "The Bloor Street Viaduct." Number present 60, including delegates from the Second International Good Roads Convention.

Thursday, April 1st, 1915.—Address, illustrated with lantern slides. Speaker, Dr. John A. Amyot. Subject, "The work of the International Waterways Pollution Commission and Sewage Disposal in General." Held in Chemistry and Mining Building, University of Toronto. Number present, 60.

Thursday, April 22nd, 1915.—Address, illustrated with lantern slides. Speaker, Mr. H. S. Van Scoyoc. Subject, "Concrete Road Construction with reference to the Toronto-Hamilton Highway." Held in Society's Rooms at Engineers' Club. Number present, 60.

Friday, June 11th, 1915.—Business Meeting. Object, "The formation of Standing Committees to work in unison with those formed in Montreal on the various branches of the profession." Held in Society's Rooms at Engineers' Club. Number present, 40.

Tuesday, November 22nd, 1915.—Address. Speaker, Mr. J. A. D. McCurdy. Subject, "Aviation and its use in the War." Held in Chemistry and Mining Building, University of Toronto. Number present, 75.

Friday, December 17th, 1915.—Business Meeting. Object, "To bring out discussion on the proposed Amendments to the Society's By-Laws made by the Council and those made by the British Columbia Members, and the presentation of Committee Reports."

Held in the Society's Rooms at Engineers' Club. Number present, 45.

Friday, January 14th, 1916.—Annual Meeting. Held in Society's Rooms, Engineers' Club. Reports of Committees received and discussed. Election of Officers. Number present, 60.

Mr. Weller, Chief Engineer of the Welland Ship Canal kindly invited the Branch to inspect the construction work between Thorold and Port Weller.

On Friday morning, November 5th, the members left Toronto in cars provided through the kindness of Mr. Kelley of the Grand Trunk Railway, and arrived at Thorold before noon.

The party walked over a short section of the work before lunch, which was served in a construction camp.

Under the guidance of Mr. Weller and staff, the party then proceeded the remaining distance in observation cars kindly provided by the Toronto, Niagara and St. Catharines Railway, over Mr. Weller's construction railway, stopping at various points to inspect and receive detailed descriptions and explanations.

This wonderful work is proceeding quietly without the usual clamour that accompanies work of this magnitude, and a trip of this kind convinces one that Canada is not behind in engineering feats.

After leaving Port Weller, the party returned over the Toronto, Niagara and St. Catharines Railway to St. Catharines, where dinner was served.

The trip was thought by all to be most instructive and interesting, and the Branch is indebted to all the officials who aided to make it so successful.

The Rooms of the Branch consisting of a Lecture Room and Reading Room, are in the Engineers' Club of Toronto. An extensive Library is available for use by the members, being the combined libraries of the Toronto Branch of the Canadian Society of Civil Engineers, the Engineers' Club, the Ontario Association of Land Surveyors and the Ontario Society of Architects. A Library Committee of the Toronto Branch has been at work, and numerous additions and improvements have been made. Comfortable Reading Rooms are available and an increasing number of readers are making use of the privileges.

The financial statement for the year shows that the Branch is in fair condition, due to the rigid economy exercised throughout the year.

We regret to report the death of Mr. R. Sherwood Elmsley, A.M.Can.Soc.C.E., and member of the Toronto Branch.

The following Officers were elected unanimously :—

Chairman—Geo. A. McCarthy, Engineer, Railways & Bridges, City.

Secretary-Treasurer—Prof. L. M. Arkley, University of Toronto.

Executive—E. W. Oliver, Assistant Engineer, C.N.R.

A. H. Harkness, Structural Engineer.

A. M. Mudge, Electrical Engineer.

H. G. Acres, Hydraulic Engineer.

C. H. R. FULLER, Secretary-Treasurer.

J. R. W. AMBROSE, Chairman.

Moved by Mr. J. R. W. Ambrose, seconded by Mr. A. F. Macallum, that the report of the Toronto Branch be adopted as presented. Carried.

REPORT OF THE QUEBEC BRANCH.

To the President and Members of the Canadian Society of Civil Engineers :—

The Council of the Quebec Branch of the Canadian Society of Civil Engineers begs to submit the following report for the year 1915 :—

MEMBERSHIP.

Members	23
Associate Members	53
Juniors	13
Associates (Branch)	2
Students	19

110

This is an increase of twelve over last year's membership. The Annual Meeting of the Quebec Branch was held on the 18th January, 1916. The following officers were elected :—

Chairman—S. S. Oliver.

Secretary-Treasurer—Ivan E. Vallée.

Councillors—T. A. J. Forrester, Gabriel Henry, J. F. Guay.

The Past Chairmen were :—W. D. Baillairgé, A. R. Décary, A. Amos.

Seven meetings of the Branch were held during the year.

During the past year, one candidate, Mr. J. A. Lefebvre, presented himself for examination in Municipal Engineering, and having been found qualified, was admitted as Associate Member.

It is with much regret that we have to note the death of one of our well-known members, Mr. A. Leofred.

Ten of our members have volunteered for overseas service in the present war, namely: Lt.-Col. F. M. Gaudet, R. A. Sterling, Major T. L. Tremblay, Lt.-Col. J. A. Dansereau, E. O. Greening, N. Barclay, R. S. Smith, E. E. Hawkins, Lt. Merrylees and C. C. Lindsay. Of the above, Mr. R. A. Sterling has been reported killed in action, and his death is deeply regretted by the members of this Branch.

The following are the Officers elected by the Branch for the year 1916:—

Chairman—A. E. Doucet.

Secretary-Treasurer—I. E. Vallée.

Councillors—T. A. J. Forrester,
Gabriel Henry,
Altheod Tremblay.

Respectfully submitted,

STUART S. OLIVER, Chairman.

IVAN E. VALLÉE, Secretary-Treasurer.

Moved by Mr. A. Surveyer, seconded by Mr. C. B. Brown, that the report of the Quebec Branch be adopted as presented. Carried.

BRITISH COLUMBIA DIVISION.

PROF. C. H. McLEOD,

Secretary Canadian Society of Civil Engineers,
176 Mansfield Street, Montreal.

Dear Sir:—

I have pleasure in transmitting herewith a copy of the minutes of the First Meeting of the Committee of the Provincial Division of British Columbia held on October 23rd, 1915, and also of the First General meeting of the British Columbia Division held on the 11th day of December, 1915.

I may say that the By-Laws for the Division have not yet been completed.

Yours very truly,

E. A. CLEVELAND, Secretary-Treasurer.

MINUTES OF PROVINCIAL COMMITTEE.

The first meeting of the Provincial Committee of the Provincial Division of British Columbia of the Canadian Society of Civil Engineers met on Saturday, 23rd October, 1915, at 10.30 a.m., in the room of the Vancouver Branch, 1017 Metropolitan Building, Vancouver, B.C.

The following members were present:—A. E. Ashcroft, Vernon, B.C.; A. D. Creer, Vancouver, B.C.; W. K. Gwyer, Yale, B.C.; D. R. Harris, Victoria, B.C.; R. F. Hayward, Vancouver, B.C.

It was moved by Mr. Creer and seconded by Mr. Gwyer, "That Mr. Hayward take the chair for this meeting." Carried.

It was moved by Mr. Hayward and seconded by Mr. Gwyer, "That Mr. Mills act as Secretary for this meeting." Carried.

The Secretary then read a letter from Professor McLeod, dated March 16th, 1915, stating that the By-Law "Re" formation of Provincial Divisions of the Society had been adopted. Also a letter from Professor McLeod, dated July 22nd, 1915, stating that Provincial Division of British Columbia is duly constituted.

The Secretary then read By-Law 56 relating to the formation of Provincial Divisions.

It was moved by Mr. Creer and seconded by Mr. Ashcroft, "That embodied in the By-Laws be that the first Executive Committee of the Provincial Division of British Columbia consist of the following members who were elected by the vote of their respective Branches and outside membership:—Mr. D. R. Harris and Mr. Wm. Young, Victoria; Mr. A. D. Creer and Mr. R. F. Hayward, Vancouver; Mr. E. A. Ashcroft, Vernon, and Mr. W. K. Gwyer, Yale, for Outside Members; Mr. T. H. White and Mr. N. J. Ker, Councillors of Parent Society, ex-officio." Carried.

It was moved by Mr. Harris and seconded by Mr. Gwyer, "That Mr. White be asked to act as first Chairman of the Provincial Division of British Columbia of the Canadian Society of Civil Engineers." Carried.

It was moved by Mr. Creer and seconded by Mr. Harris, "That Mr. Cleveland be asked to act as first Secretary-Treasurer of the Provincial Division of British Columbia of the Canadian Society of Civil Engineers." Carried.

It was moved by Mr. Creer and seconded by Mr. Ashcroft, "That when necessary the business of the Provincial Division be conducted by correspondence." Carried.

After a short discussion, it was moved by Mr. Ashcroft and seconded by Mr. Gwyer, "That Mr. Hayward, Mr. Creer and Mr.

Cleveland be asked to draft a set of By-Laws for the Provincial Division and submit them to the Committee for further discussion." Carried.

It was moved by Mr. Harris and seconded by Mr. Gwyer, "That the first Annual Meeting of the Provincial Division of the Canadian Society of Civil Engineers be held December 10th and 11th, in Vancouver, at the same time as the Convention of the Victoria and Vancouver Branches." Carried.

The Chairman instructed the Secretary to forward a copy of the minutes of this Meeting together with a copy of the By-Laws of the Vancouver Branch to each of the Members of the Committee of the Provincial Division of British Columbia.

The meeting then adjourned.

Minutes of the First General Meeting of the British Columbia Division of the Canadian Society of Civil Engineers, held concurrently with the Fourth Annual Convention of the Victoria and Vancouver Branches of the Society on Saturday, the 11th day of December, 1915, at 10.30 a.m., at the Board of Trade Rooms, in the City of Vancouver.

The following members were present:—F. C. Gamble, President Canadian Society of Civil Engineers, in the Chair; T. H. White, (Councillor), Vancouver; N. J. Ker, (Councillor), Vancouver; Donald Cameron, Vancouver; R. W. Macintyre, Victoria; D. R. Harris, Victoria; Richard Hall, Vancouver; H. K. Dutcher, Vancouver; H. E. R. Hamilton, Vancouver; Fred. L. Macpherson, Vancouver, (Burnaby); C. C. Worsfold, New Westminster; H. E. C. Carry, Vancouver; W. Anderson, Vancouver; E. G. Matheson, Vancouver; C. E. Cartwright, Vancouver; Chas. Garden, Vancouver; R. Fowler, Victoria; A. G. Dalzell, Vancouver; D. O. Lewis, Victoria; A. E. Foreman, Victoria; Wm. Young, Victoria; E. A. Cleveland, Vancouver; H. W. E. Canavan, Victoria; R. F. Hayward, Vancouver; F. O. Mills, Vancouver; Jas. H. Kennedy, Vancouver.

The minutes of the meeting of the last convention of the Branches were read and on motion confirmed.

Mr. Gamble, President of the Society, then addressed the meeting, expressing his pleasure in presiding, and referring to the work done by the Branches, and to the necessity of energetic endeavour on the part of each member to assist in forwarding the interests of the Society throughout the Dominion.

It was then moved by H. W. E. Canavan and seconded by Donald Cameron, "That this Convention of the Victoria and Van-

couver Branches now resolve itself into a general meeting of the British Columbia Division." Carried.

It was moved by E. A. Cléveland and seconded by T. H. White, "That the President, Mr. Gamble, continue in the Chair." Carried.

The Secretary then read the notices convening the meeting and the minutes of the first meeting of the Provincial Committee of the British Columbia Division.

It was moved by A. E. Foreman and seconded by D. R. Harris, "That the minutes of the first meeting of the Committee of the British Columbia Division be confirmed and the actions of the Committee be approved." Carried.

T. H. White, Chairman of the Division, requested that Mr. Gamble continue in the Chair during the meeting, which request was acceded to.

The following resolution was put to the meeting and carried:—

"That the Committee in charge of preparation of By-Laws for the Division submit the same by letter ballot to the members of the Society resident in the Province."

The Chairman called on the Committee appointed to consider the establishment of a standard datum plane for British Columbia for its report. Mr. Dalzell, replying for the Committee, explained that much of the work had been done by correspondence and though considerable progress had been attained some further time would be required to complete the duties laid upon the Committee.

On motion, the Committee was reappointed for the ensuing year.

H. W. E. Canavan reported that a Committee of the Vancouver and Victoria Branches had requested the Provincial Government to amend the "Interpretation Act" R. S. B. C. 1911 by inserting therein the following definition of the word "Engineer," viz.:—"Engineer" where used in the "Water Act," the "Health Act," the "Municipal Act," "Drainage and Dyking Act," and "Local Improvement Act," shall mean a member of the Canadian Society of Civil Engineers, or of the Institutions of Civil Engineers of Great Britain or of Ireland, or of the American Society of Civil Engineers. The request, however, was not granted, and in order that the matter may be further pressed, the Committee was continued for one year.

Wm. Young expressed the opinion that the objects of the Society would be furthered by a campaign to increase our "Associate" class by inviting men prominent in public life and large manufacturing enterprises to join.

The Chairman then referred to the circular letter, dated November 25th, 1915, issued by the Councillors resident in Montreal, and signed by the Secretary of the Parent Society, regarding certain proposed amendments to the By-Laws of the Society, and suggested that a letter from the British Columbia Members should be prepared and forwarded without delay to all Corporate Members of the Canadian Society of Civil Engineers.

It was moved by Mr. Lewis and seconded by Mr. Canavan, "That the Chairman appoint a Committee to draft a letter as suggested. The Chairman thereupon appointed R. F. Hayward, H. W. E. Canavan, D. O. Lewis, E. G. Matheson, to prepare a draft letter to be submitted at the afternoon session." Carried.

The meeting was then adjourned to meet at 3.00 p.m., at the Blue Room of the Hotel Vancouver.

Meeting called to order at 3.00 p.m.

It was moved by William Young and seconded by H. K. Dutcher, "Whereas it is essential that those who are eligible and desirable within the meaning of By-Law number 11 be secured as Associates.

"Therefore be it resolved that the membership bring to the attention of those who are eligible and desirable, the fact that they are eligible as Associates, and that their interest in the Society would be appreciated."

The resolution created an interesting discussion for and against, and was finally carried.

The circular letter to members of the Society as prepared by the Committee was then read and discussed in detail.

It was moved by H. K. Dutcher and seconded by H. W. E. Canavan, "That the circular letter be printed and sent to every Corporate Member without delay." Carried.

It was moved by Mr. Lewis and seconded by Mr. Cartwright, "That the circular letter be signed by the Chairmen and Secretaries of the Victoria and Vancouver Branches, and of the British Columbia Division." Carried.

It was moved by H. W. E. Canavan and seconded by A. E. Foreman, "That a letter of congratulation on his appointment as a member of the Imperial Munitions Board be sent to Mr. G. H. Dawson, A.M.Can.Soc.C.E." Carried.

A vote of thanks to the President for his services as Chairman was moved by H. F. Hayward, seconded by Donald Cameron, and carried.

Mr. T. H. White, as Chairman of the Division, tendered Mr. Gamble the thanks of the meeting, to which the President replied.

The meeting then adjourned to the 10th day of December, 1916.

In the evening a *Conversazione* was held at the Hotel Vancouver, which was well attended by members and guests, and proved to be an interesting and enjoyable function.

A unique feature was introduced by the exhibition of full sized high explosive shell casings manufactured in Vancouver for the battle front, the process employed being graphically explained by an expert, who, commencing with the rough billet, carried his interested audience, step by step, through to the finished product.

It was moved by Mr. D. O. Lewis, seconded by Mr. J. R. W. Ambrose, that the report of the British Columbia Division be adopted as presented. Carried.

REPORTS OF COMMITTEES.

Cement Specifications.—Mr. E. Brown moved the adoption of the report of the Committee on Portland Cement and the accompanying specification as printed on pages 10, 11 and 12 of the Reports of Committees. Mr. W. J. Francis seconded the motion.

The Secretary presented a letter from Mr. W. G. Chace in discussion of the proposed specification. After this letter had received consideration, the motion was put and unanimously adopted.

The President stated that the specification as recommended by this Committee become a Standard Specification of the Society.

It was then resolved to adjourn the meeting to the following day at 3.00 p.m.

WEDNESDAY AFTERNOON SESSION, JANUARY 26TH, 1916.

Mr. F. C. Gamble, President, in the Chair.

Mr. E. W. Oliver presented the report of the Committee appointed to draft a resolution on Society affairs and proposed the following, seconded by Mr. J. A. Jamieson:—

“That this meeting instruct the Council to appoint a Committee for the purpose of studying and reporting upon a policy for increasing the prestige and influence of the Society and including a consideration of the organization and by-laws and for making such recommendations for amendments, if any, as they see fit. The personnel of the Committee is to be composed of representatives of each district and of the same number as the representation on the

Council, each district to elect its own representatives. The Branches within each district shall nominate for election their representatives, but where no Branch exists the Council shall nominate not less than three candidates for election in that district. The Committee appointed shall have power to select its own Chairman, Vice-Chairman and Secretary and obtain all necessary information from headquarters.

"The Council shall so soon as the Committee has been appointed call for the election of the Chairman of the Committee, and for this purpose shall issue a ballot which shall include all the names of the said Committee.

"The Committee shall report to the Council not later than the first day of September, 1916, and such report shall be distributed by the Council to the members of the Society within thirty days thereafter."

This resolution was adopted.

A letter from Mr. J. G. LeGrand, as to existing conditions in the Dominion and in the Society as affected by the great war, was read by Mr. B. S. McKenzie.

Following a discussion on the issue raised by Mr. LeGrand, it was moved by Mr. H. R. Safford, seconded by Mr. A. F. Macallum, "That a Committee be appointed, consisting of Messrs. Conway, Mountain, Monsarrat and Anderson, and such others as the President may name, to consider and prepare a formal resolution to be sent to the proper military authorities, offering support and co-operation on behalf of the Society along the lines of engineering assistance in the matter of training engineer officers." Carried.

The Secretary read a letter received from the Ottawa Branch giving particulars of the recent activities of that Branch in military engineering.

CONTINUATION OF REPORTS OF COMMITTEES.

Mr. James White, as Chairman of the Committee on Conservation, presented the report of his Committee as printed. After discussion the report was accepted as a progress report.

It was moved by Mr. A. F. Macallum, seconded by Mr. W. F. Tye, "That all the other reports on the agenda be considered as read." Carried.

Report of Electro-Technical Commission.—Dr. L. A. Herdt.—

"The report is printed on pages 12 and 13 of the Reports of Com-

mittees, and I would move that the report of this Committee be received and the Committee be re-appointed."

Seconded by Mr. J. Duchastel. Carried.

Report of Committee on Steel Bridge Specifications.—Mr. P. B. Motley presented a progress report on Steel Bridge Specifications. He suggested a reorganization of the work of the Committee. On motion by Mr. Motley, seconded by Mr. G. A. Mountain, it was resolved that the interim report of the Committee on Steel Bridge Specifications, as printed on page 23 of the Reports of Committees, be received and the Committee be continued. Carried.

The further consideration of Reports of Committees was then adjourned until Thursday morning, and the President delivered his address. On the conclusion of the address Mr. G. A. Mountain moved, seconded by Mr. C. H. Keefer, that Mr. W. F. Tye, Past-President of the Society, take the Chair for a few moments.

Mr. W. F. Tye.—"Gentlemen.—You have listened to this very instructive address with a great deal of pleasure I know, as I have. I would call upon Colonel Anderson to move a vote of thanks."

Col. W. P. Anderson, in moving a vote of thanks, congratulated Mr. Gamble on his very interesting address, and expressed for himself and the members present high appreciation of the manner in which so important a subject—The Development of the Western Coast of Canada—had been treated.

Mr. C. H. Keefer seconded the resolution of thanks, which was adopted with applause.

Mr. Gamble addressed the meeting in the following words:—

"I am very grateful to you for the very kind and flattering remarks you have made. I am sure that it has been a pleasure to come here to meet you and to find so many cordial and genial friends who have shown me a great deal of kindness. I can only hope that if you ever do come as far as the Coast that you will come in large numbers so that we may have the opportunity of tendering to you the hospitality of British Columbia. We looked forward to that visit last year, but we quite understood the reasons of the cancellation of that engagement with us. I thank you very much."

The session then adjourned.

MORNING SESSION, THURSDAY, JANUARY 27TH, 1916.

The President, Mr. F. C. Gamble, in the Chair.

CONTINUATION OF THE RECEPTION OF REPORTS OF COMMITTEES.

Report of Committee on Sewage Disposal and Sanitation.—Moved by Mr. A. Surveyer, seconded by Mr. W. Muir Edwards, that this report be received. Carried.

It was then moved by Mr. Edwards, seconded by Mr. Surveyer, "That in the opinion of this Society it is desirable that a communication be sent to the Provincial Boards of Health by the incoming Council, pointing out that it is inadvisable that any Public Officials before whom plans of Water Works or Sewerage Systems come for approval shall be financially interested in the use of any special form of plant, apparatus or system connected therewith."

The motion, after discussion, was put to the meeting and lost on division.

Report on Educational Requirements.—Mr. E. Marceau presented the report as published and then moved, seconded by Col. W. P. Anderson, that the report of the Committee on Educational Requirements be adopted and the Committee continued. Carried.

Report of the Examination Board.—Moved by Prof. H. M. MacKay, seconded by Mr. A. Surveyer, that the report of the Examination Board be received. Carried.

Report of Committee on Reinforced Concrete.—Moved by Mr. W. J. Francis, seconded by Prof. E. Brown, that the report of the Committee on Reinforced Concrete be received and the Committee continued. Carried.

Report of Committee on General Clauses for Specifications.—After discussion it was moved by Sir John Kennedy, seconded by Mr. C. H. Keefer, that the report of the Committee on General Clauses be accepted as a progress report and the Committee continued. Carried.

It was understood that the Committee should give special attention to the preparation of "draft clauses" applicable to different lines of work, and on the request of Mr. Ambrose, the report of the Toronto Committee on General Clauses for Specifications was to be turned over to the Committee for its information.

Report of Committee on Cast Iron Water Pipes and Specials.—In the absence of the Chairman of the Committee, the Secretary read the report.

On motion by Mr. W. F. Tye, seconded by Sir John Kennedy, the report was received and the Committee discharged.

It was understood that the existing specifications as to cast iron water pipes should be retained as the Standard Specifications of the Society.

The Committee appointed at the Wednesday afternoon session to prepare a resolution to be submitted to the military authorities of the Government, renewing its offer of support and co-operation in the matter of training engineer officers, reported the following resolution:—

The resolution was proposed by Mr. G. R. G. Conway, seconded by Mr. G. A. Mountain, and adopted by unanimous vote of the meeting.

“That the Canadian Society of Civil Engineers assembled at their Annual Meeting, and including representatives from all parts of Canada, realizing that the work of the trained engineer is becoming more and more of vital importance for the successful termination of the present war, desires to place its organization at the disposal of the Dominion Government for the purpose of assisting and co-operating by every means in its power in properly training competent officers for the engineering branches of the service.

“This meeting believes that by the hearty and loyal co-operation of the Society which its members are anxious to give, the Dominion Government would have available for advice and assistance at all times, the organized services of the best and most highly trained engineers in Canada.

“The Society would draw attention to the fact that already about twelve per cent. of its membership has volunteered for the defence of the Empire, but feels that the services of these men have not been used to the best advantage, as many of them have been drafted into other branches of the service than the engineers. The Society would impress upon the Government the importance of requiring that all engineer officers should have had practical engineering training before receiving commissions.”

The Secretary was instructed to forward the resolution to the Premier and the Minister of Militia, and after receiving an acknowledgment to give it to the Press.

Reports of Scrutineers.—Messrs. Riddell, Stead, Graham and Hutchison, Auditors, who had been appointed scrutineers of the ballots, presented their reports.

The President declared the result of the vote on Amendments to By-Laws as follows:—462 valid votes were cast. The amendments to By-Laws Nos. 7, 18, 27, 29, 30, 36, 50 and 56 as proposed by the Council of the Society were carried. The amendments to By-Laws Nos. 7, 8, 9, 10, 16, 27, 30, 33 and 56 as proposed by British Columbia members were not adopted.

As a result of the vote for Officers and Members of Council for the next terms, the President declared the following elected:—

As President for 1916, Mr. G. H. Duggan.

As Vice-President for the term of 3 years, Mr. T. H. White.

As Councillors for 3 years, Mr. J. R. W. Ambrose, Mr. H. Donkin, Mr. A. E. Doucet, Mr. W. J. Francis, Mr. E. D. Lafleur, Mr. D. O. Lewis, Mr. D. A. Ross, Mr. H. R. Safford.

Mr. Gamble then requested the newly elected President, Mr. G. H. Duggan, to take the Chair.

Mr. Duggan addressed the meeting as follows:—

“I thank you for this reception. I appreciate most highly the honour you have conferred upon me in electing me to this office, which has been held by some of our most illustrious engineers, and is the highest ambition of every Canadian engineer. It shall be my highest endeavour to uphold the traditions of this Society, as well as those progressive ideas so well voiced at this meeting.”

CONTINUATION OF REPORTS OF COMMITTEES.

Report of Committee on Roads and Pavements.—Moved by Mr. A. F. Macallum, Seconded by Mr. J. R. W. Ambrose, that the report of the Committee on Roads and Pavements be received and the Committee continued. Carried.

Election of Members of Nominating Committee.—The President called for nominations to the Committee to make nominations for Officers and Members of Council for the year 1917. The Secretary read the following, which had been submitted:—

For District No. 1 by the Council of the Society—Messrs. Ernest Brown and L. A. Amos.

For District No. 2 by Members of the Council resident in that district—Mr. G. G. Murdoch.

For District No. 3 by the Québec Branch—Messrs. Altheod Tremblay and A. E. Doucet.

For District No. 4 by the Ottawa Branch—Messrs. G. A. Mountain, C. R. Coutlee and A. B. Lambe.

For District No. 5 by the meeting—Mr. A. F. Macallum.

For District No. 6 by the Manitoba Branch—Messrs. W. L. Mackenzie and J. A. Douglas.

For District No. 6 by the Regina Branch—Messrs. H. S. Carpenter and R. J. Leckie.

For District No. 6 by the Edmonton and Calgary Branches—Mr. J. Chalmers.

For District No. 7 by the Victoria and Vancouver Branches—Mr. E. A. Cleveland.

Mr. J. Duchastel and Mr. H. M. MacKay were appointed scrutineers, and a ballot was taken as a result of which the following were elected to the Committee:—

For District No. 1—	E. Brown.
“ “ “ 2—	G. G. Murdoch.
“ “ “ 3—	A. Tremblay.
“ “ “ 4—	G. A. Mountain.
“ “ “ 5—	A. F. Macallum.
“ “ “ 6—	J. Chalmers.
“ “ “ 7—	E. A. Cleveland.

Gzowski Medal.—The Committee presented its report recommending that the Gzowski Medal should be awarded to Messrs. E. Brown, H. M. MacKay and C. M. Morssen for their paper No. 373 on Tests on the Shearing Resistance of Reinforced Concrete Beams. It was moved by Mr. G. A. Mountain and seconded by Mr. A. R. Decary that this report be adopted. Carried.

It was moved by Mr. G. A. Mountain, seconded by Col. W. P. Anderson, that it be recommended to the Committee on the revision of by-laws, etc., to consider the advisability of changing the designation of the Society to that of Canadian Institution of Civil Engineers. Carried.

The following votes of thanks were unanimously adopted:—

To the retiring President and Members of Council on motion by Mr. G. A. Mountain, seconded by Mr. H. D. Lumsden.

To the Montreal Tramways Company on motion by Mr. A. F. Macallum, seconded by Mr. J. R. W. Ambrose.

To the Railways of the Eastern Canadian Passenger Association on motion by Mr. C. H. Keefer, seconded by Mr. Stuart Howard.

To the Railways of the Western Canadian Passenger Association on motion by Mr. W. Muir Edwards, seconded by Mr. F. de C. Davies.

To the Canadian Vickers Company, Limited, on motion by Mr. Wm. McNab, seconded by Mr. J. A. Jamieson.

To the Reception and Entertainment Committees for the Meeting, on motion by Col. Anderson, seconded by Mr. Geoffrey Stead.

The meeting then adjourned.

DEC 21 1918

The
Canadian Society of Civil Engineers
176 Mansfield Street, Montreal

Established February 24th, 1887.
Incorporated by Dominion Act, June 23rd, 1887
(50 Vic., Cap. 124)

REPORT
OF
ANNUAL MEETING
1917

Volume XXXI

MONTREAL:
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The Canadian Society of Civil Engineers.

REPORT OF PROCEEDINGS OF THE THIRTY-FIRST ANNUAL
MEETING HELD AT THE SOCIETY'S HOUSE, 176 MANS-
FIELD STREET, MONTREAL, 23RD AND 24TH JANUARY, 1917.

MORNING SESSION, 23RD JANUARY, 1917.

The Meeting was called to order at ten o'clock a.m. Mr. G. H. Duggan, President, occupied the Chair.

The Minutes of the last Annual Meeting were read and approved.

The President, with the concurrence of the Meeting, announced a departure from the order of business specified in the notice of the Meeting. The Report of the Committee on Society Affairs would be taken up as the first item of business in the Afternoon Session, and the reports of Scrutineers would be presented on Wednesday afternoon instead of Thursday forenoon as announced.

Mr. G. A. McCarthy moved, seconded by Mr. H. V. Brayley, that the ordinary reports of committees be taken up this morning, leaving the afternoon for the President's address, the Report of Council and the Report of the Committee on Society Affairs. Carried.

It was moved by Mr. James White, seconded by Mr. F. W. Cowie, that when the Report of Council is received this morning, its discussion be adjourned until the afternoon. Carried.

With the approval of the Meeting the President named the Society's Auditors, Messrs. Riddell, Stead, Graham and Hutchison, represented by Mr. Pope, as scrutineers of the ballots for the election of officers and members of Council.

REPORT OF COUNCIL FOR THE YEAR 1916.

The Council presents the following report on the work of the Society during the past year:—

ROLL OF THE SOCIETY.

Elections during the year resulted in the following additions to the Roll: Eighteen Members, sixty-nine Associate Members, two Associates, twenty-three Juniors and thirty-four Students. One former Associate Member and one former Junior were reinstated.

The following transfers were made: Twenty-three Associate Members to the class of Member, eighteen Juniors and eighteen Students to the class of Associate Member, and twenty-seven Students to the class of Junior.

There have been removed from the rolls by resignation or on account of non-payment of dues, ten Members, forty-four Associate Members, three Associates, nine Juniors and seventy-two Students. These resignations were due either to the fact that those concerned had ceased active engineering work or were, owing to lack of employment, unable to pay the annual dues.

The following deaths, thirty-nine in number, have been reported as having occurred during the year; of these, as will be noted, 21 gave their lives in the defence of the Empire.

Members.....Aylen, John.
 Barrow, Ernest George.
 Berlinguet, F. X.
 Bowman, Herbert Joseph.
 Carman, Guy C.
 Corthell, Elmer Lawrence.
 ♂ Creighton, Frank A.
 Gibson, Peter Silas.
 ♂ Greenwood, H. S.
 Kunz, F. C.
 Mann, William E.
 Osler, Charles Hodgson.
 Reynolds, Samuel Henry.
 Roy, R. Maitland.
 Williams, David.

Associate Members.....♂ Agnew, Augustus W.
 Auclair, H. L.
 Bradshaw, Walter E.
 ♂ Christie, Reginald M.
 Currie, Archibald.
 ♂ Dann, E. M.
 ♂ Davis, George H.

Associate Members.....	♂ Evans, Alex. E.
	♂ Haffner, Henry J. A.
	♂ Hick, H. Crispin.
	♂ Millican, Chas. Arthur.
	♂ Otty, George N. D.
	Perley, George E.
	♂ Vansittart, George E.
Juniors.....	♂ Bauset, Maurice E.
	♂ McKnight, Augustus Wilberforce.
	♂ Parr, Clayton B.
	Verge, LaBillois.
	♂ Weeks, Stephen Frederick.
Students.....	♂ Burrows, Bruce Hosmer Acton.
	♂ de Quetteville, Stanley N.
	♂ Fair, Robert McCamus.
	♂ Raley, William E.
	♂ Ross, Charles F. D.

At present the membership stands as follows:—

Honorary Members	8
Members	709
Associate Members	1,434
Associates	33
Juniors	376
Students	487

Total..... 3,047

The membership of the Branches at the date of the last Annual Meeting was as follows:—

	Corporate.	Non-Corporate.	Total.
Quebec	73	26	99
Ottawa	166	56	222
† Kingston	14	13	27
Toronto	134	83	217
Manitoba	107	37	144
Calgary	43	9	52
† Vancouver	112	20	132
Victoria	54	10	64
Edmonton	33	9	42
Regina	21	2	23
	757	265	1,022

†As reported for 1915.

♂ Killed in action or died as a result of wounds.

ANNUAL MEETING.

The thirtieth Annual Meeting was held at 176 Mansfield Street, Montreal, in January, 1916, under the presidency of Mr. F. C. Gamble.

The first session was called to order on Tuesday, January 25th, at 10 a.m., and the meeting was adjourned on Thursday afternoon, January 28th.

MEETINGS.

The Council held twenty-nine meetings during the year.

There have been nine sectional meetings, six monthly meetings, and one special meeting of the Society.

The following papers and addresses were presented at these meetings:—

"Construction of the Rogers Pass Tunnel," by Mr. J. G. Sullivan, M.Can.Soc.C.E.

"The Method Employed in Designing the Foundation of the Federal Palace, Mexico," by Mr. S. J. Fortin, M.Can.Soc.C.E.

"Interesting Features of Reinforced Concrete Buildings in and around Montreal," by Mr. C. M. Morssen, M.Can.Soc.C.E.

"Manufacture of Brass Cartridge Cases in Canada," by Mr. H. H. Vaughan, M.Can.Soc.C.E.

"Economic and Strategic Aspects of Enlargement of Welland Canal and of Construction of Georgian Bay Ship Canal," by Col. R. W. Leonard, M.Con.Soc.C.E.

"The Rules and Regulations of the Province of British Columbia relating to Annual Rental Fees of Water Powers," by Mr. E. Davis, M.Can.Soc.C.E.

"The Latest Advances in Bayonet Fighting," by Capt. P. E. Nobbs.

"The Design of Passenger Terminals," by Mr. J. L. Busfield, A.M. Can.Soc.C.E.

"Electrical Precipitation of Solids from Gases," by Mr. Linn Bradley.

"The Rolling and Floating Steel Caissons of the Levis Dry Dock," by Mr. L. R. Thomson, A.M.Can.Soc.C.E.

"The Difficulties of Earth Slides in the Culebra Cut, Panama Canal," by Mr. John Murphy, M.Can.Soc.C.E.

"Description of Original Diagrams for making Military Scales, for Interpolation of Contours and Reduction and Enlargement of Maps," by Lt.-Col. F. A. Snyder, M.Can.Soc.C.E.

"The Law and the Engineer," by Mr. Geo. H. Montgomery, K.C.

"Description of a Series of Photographs from the Western Battle Front," by Mr. Paul A. N. Seurot, M.Can.Soc.C.E.

"The Aqueduct for the Greater Winnipeg Water District," by Mr. W. G. Chace, M.Can.Soc.C.E.; Mr. M. V. Sauer, M.Can.Soc.C.E., and Mr. D. L. McLean, A.M.Can.Soc.C.E.

"Some Phases of Railway Work at the Front," by Lieut. Paul Ogilvy.

"Experiences as a Machine Gun Officer at the Front," by Capt. Jas. G. Ross.

"Bombing in the Front Line Trenches," by Capt. G. L. Dobbin.

"The Water Supply of the City of Port Arthur," by Mr. L. M. Jones, A.M.Can.Soc.C.E.

"High Tension Transmission Line Towers," by Mr. L. R. Thomson, A.M.Can.Soc.C.E.

"Aviation Work at the Front," by Lieut. E. Laurie.

Discussion on the "Proposed Specifications for Highway Bridges."

"Filtration Experience," by Mr. H. G. Hunter, M.Can.Soc.C.E.

BRANCH SOCIETIES.

The several Branches of the Society, their Headquarters and Officers at this date, are as follows:—

Vancouver—Headquarters, Metropolitan Building.

Chairman, R. F. Hayward.

Sec.-Treas., A. D. Creer.

Manitoba —Headquarters, University of Manitoba, Winnipeg.

Chairman, W. G. Chace.

Sec.-Treas., A. W. Smith, Room 454, Union Station,

Toronto —Headquarters, Engineers' Club, King Street West.

Chairman, G. A. McCarthy.

Sec.-Treas., L. M. Arkley, University of Toronto.

Ottawa —Headquarters.

Chairman, John Murphy.

Sec.-Treas., J. B. Challies, Room 404, Union Bank Bldg.

Kingston —Activities discontinued until the close of the war.

Quebec —Headquarters, City Hall. (Address Box 115).

Chairman, A. E. Doucet.

Sec.-Treas., W. Lefebvre.

Victoria —Headquarters, 408 Belmont House. (Address P.O. Box 1290).

Chairman, D. O. Lewis.

Sec.-Treas., R. W. Macintyre.

Calgary —Headquarters. (Address Box 2318).

Chairman, A. S. Dawson.

Sec.-Treas., S. G. Porter.

Edmonton —Headquarters, University of Alberta. (Address Box 957).

Chairman, L. B. Elliot.

Sec.-Treas., A. W. Haddow, c/o City Engineering Dept.

Regina —Headquarters.

Chairman, L. A. Thornton.

Sec.-Treas., J. N. de Stein, 2123 Retallack St.

COMMITTEES.

The following have been the Committees of Council during the year:—

Library and House Committee:

Brown, S. P., Chairman.

Shearwood, F. P.

Frigon, A.

Surveyer, A.

Safford, H. R.

Finance Committee:

Ross, R. A., Chairman.

Monsarrat, C. N.

Duggan, G. H.

Vaughan, H. H.

Marceau, E.

Committee on Meetings:

W. J. Francis, Chairman.

The Chairmen and Vice-Chairmen of Sections, and the Chairmen of Branches.

The Board of Examiners for admission of candidates under By-laws 8 and 9 was as follows:—

MacKay, H. M., Chairman.

Surveyer, A., Secretary.

Beullac, M.

Lea, R. S.

Fairbairn, J. M. R.

Roberts, A. R.

Flahault, J.

Committee on Gzowski Medal and Prizes for Students' Papers:—

Johnson, Phelps, Chairman.

Lewis, D. O.

Ambrose, J. R. W.

Wilson, R. M.

Conway, G. R. G.

Committee on Publications:

MacKay, H. M., Chairman.	Safford, H. R.
Brown, E.	Surveyer, A.
Conway, G. R. G.	Thomson, W. Chace.
Gale, G. G.	Wilson, R. M.
Haultain, H. E. T.	

OFFICERS OF SECTIONS.

General:

J. Duchastel, Chairman.
H. A. Mackay, Vice-Chairman.

Electrical:

J. C. Smith, Chairman.
J. deG. Beaubien, Vice-Chairman.

Mechanical:

J. M. Robertson, Chairman.
F. B. Brown, Vice-Chairman.

Mining:

H. E. T. Haultain, Chairman.
J. B. Porter, Vice-Chairman.

The following have been the Committees of the Society during the year:—

Nominating Committee for Officers and Members of Council for the year 1917:

Ernest Brown, Chairman, representing District No. 1.	
Phelps Johnson.	} Past Presidents.
M. J. Butler, C.M.G.	
F. C. Gamble.	
G. G. Murdoch, representing District No. 2.	
A. Tremblay, " " " "	3.
G. A. Mountain, " " " "	4.
A. F. Macallum, " " " "	5.
J. Chalmers, " " " "	6.
E. A. Cleveland, " " " "	7.

Educational Requirements:

Marceau, E., Chairman.	MacKay, H. M.
Holgate, H.	Porter, J. B.
Irwin, H.	Surveyer, A.
Leonard, R. W.	Tye, W. F.

Sewage Disposal and Sanitation:

Surveyer, A., Chairman.	Lea, R. S.
Chipman, W.	Lea, W. S.
Edwards, W. Muir.	Macallum, A. F.
Gillespie, P.	Meadows, J. O.
Kennedy, John.	McPherson, A. J.
Lafreniere, T.	Rust, C. H.

Steel Bridge Specifications:

Motley, P. B., Chairman.	McLeod, N. M.
Bowden, W. A.	McMath, F. C.
Duggan, G. H.	Monsarrat, C. N.
Kelley, H. G.	Shearwood, F. P.
LeGrand, J. G.	

Conservation:

White, James, Chairman.	Laurence, H. F.
Bayne, G. A.	Lea, R. S.
Breithaupt, W. H.	Leonard, R. W.
Brydone-Jack, E. E.	McColl, R.
Cambie, H. J.	McNab, Wm.
Challies, J. B.	McPherson, A. J.
Chalmers, John.	Mitchell, C. H.
Coutlee, C. R.	Parsons, W. R. W.
Dennis, J. S.	Shewen, E. T. P.
Dodwell, C. E. W.	Sweezey, R. O.
Doucet, A. E.	Tracy, T. H.
Hegan, J. B.	

The Electro-Technical Commission:

Herd, L. A., Chairman.	Kynoch, J.
Barnes, H. T.	Lambe, A. B.
Gill, L. W.	Murphy, J.
Higman, O.	Rosebrugh, L. A.

Reinforced Concrete:

Francis, W. J., Chairman.	Mattice, E. S.
Baulne, S.	Monsarrat, C. N.
Brown, E.	Morssen, C. M.
Brydone-Jack, E. E.	Motley, P. B.
Gillespie, P.	Rolph, H.
MacKay, H. M.	

General Clauses for Specifications:

Holgate, H., Chairman.	Chipman, W.
Cape, E. G. M.	Kerry, J. G. G.

Roads and Pavements:

McLean, W. A., Chairman.	Macallum, A. F.
Brereton, W. P.	McPherson, A. J.
Doane, F. W.	Mercier, P.
Duchastel, J.	Near, W. P.
Griffith, J. E.	Powell, G. G.
Henry, G.	Rust, C. H.
James, E. A.	

Steam Boiler Specifications:

Arkley, L. M., Chairman.	Durley, R. J.
Bayfield, H. A.	Robb, D. W.
Chace, W. G.	Vaughan, H. H.
Clark, F. G.	

The awards of the Gzowski Medal and of prizes for the best students' papers will be announced during the annual meeting.

As no papers have been presented on mining or metallurgical subjects during the year, there will be no award of medals in these subjects.

The following is a detailed statement of elections which have taken place during the year:—

January 24th, 1916.

Members:

Carter, E. F.	Dunn, T. H.
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Associate Members:

Amlie, F. E.	MacGillivray, A.
Ewing, W. C.	MacPherson, N. W.
Galbraith, W. J.	Muir, R. C.
Hagarty, R. E. W.	Robertson, H.
Henham, R.	Saynor, F.
Langlois, R.	

Junior:

Burton, E. C.

Transferred from the Class of Associate Member to that of Member:

Sweezy, R. O.

Transferred from the Class of Student to that of Associate Member:

Woodyatt, J. B.

Transferred from the Class of Student to that of Junior:

Dawson, I. H.

Painchaud, F. B.

Ferguson, L. L.

Savary, R. J. L.

La Mothe, G. E.

Students:

Bangs, R. G.

Stark, W. H.

February 17th, 1916.

Students:

Aggiman, J. H.

MacLachlan, R. C.

Buckingham, E. T.

Rounthwaite, F. G.

Cumming, K. H.

Weeks, R. E.

Gagnier, O. J.

March 21st, 1916.

Members:

Binnie, A. T.

Ogilvie, N. J.

Brace, J. H.

Teele, F. W.

Hamilton, J.

Associate Members:

Augustine, A. P.

Douglas, R. H.

Barnes, H. F.

Edwards, C. P.

Blackwell, R. H. H.

Gorrie, D. F.

Burfield, F. R.

Hodgson, J. P.

Chapman, A. S.

Stamford, W. L.

Craig, J. C.

Worthington, W. R.

Daubney, C. B.

Wright, C. M.

Juniors:

Cox, O. S.

Keefer, J. A.

Dodge, C. L.

McColl, S. E.

Hughes, H. C.

Weeks, S. F.

Transferred from the Class of Associate Member to that of Member:

Young, F. M.

Transferred from the Class of Junior to that of Associate Member:

Crawley, E. A.

Transferred from the Class of Student to that of Associate Member:
Saint, J. B.

Transferred from the Class of Student to that of Junior:
Plummer, A. A. Taylor, W. H.

April 18th, 1916.

Member:

Taylor, T.

Associate Members:

Boulet, L. N.	Lindsey, C. R.
Galloway, A.	Montgomery, E. G. W.
Haddow, A. W.	Pickard, K. S.
LaForest, J. M. M.	

Junior:

Irving, G. F.

Transferred from the Class of Associate Member to that of Member:

Aitken, A. B.	Goodrich, C. M.
Gale, G. G.	McRae, J. B.

Transferred from the Class of Junior to that of Associate Member:

Hertzberg, H. F. H.	Stewart, R. B.
Marr, N.	Whitside, J. L.

Transferred from the Class of Student to that of Associate Member:

Bisson, L. J.	Paquet, D.
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Transferred from the Class of Student to that of Junior:

Frame, W. L.	Lawrence, A. J.
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Students:

Buck, C. A.	Peace, W. J.
Chalmers, G. H.	Scott, G. D.
Fraser, C. E.	Scott, G. M.
Hemmerick, G.	Turner, S. R.
Lake, N. J.	Vessot, C. N. R.
Nicholson, M. D.	

May 16th, 1916.

Members:

Blossom, F.	Molitor, D. A.
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Associate Members:

Mackenzie, H. R.	McEwen, G. G.
Matheson, W.	

Juniors:

Eardley-Wilmot, T.	Roberts, J. R.
Macdonald, D. H.	

Transferred from the Class of Associate Member to that of Member:

McConnell, S. B.	
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Transferred from the Class of Student to that of Associate Member:

Ahern, F. X.	Fleming, D. H.
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Students:

Brown, L. B.	McInnes, W. A.
Jaffary, J. H. E.	

June 27th, 1916.

Members:

Clark, F. G.	McLellan, A.
Fuertes, J. H.	Moore, J. W.
Harris, W. R.	

Associate Members:

Bowden, W.	O'Reilly, J. A. H.
Cowen, E. A.	Sutherland, N. M.
Lowrie, A. W. P.	Yorath, C. J.
Mitchell, J. T.	

Junior:

Mahon, H. W.	
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Transferred from the Class of Associate Member to that of Member:

Gray, A.	Lawson, W. S.
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Transferred from the Class of Junior to that of Associate Member:

Beausoleil, R. J.	Schenk, T. M.
Kortright, F. H.	Trudeau, L. G.
Salter, E. M.	Wardle, J. M.

Transferred from the Class of Student to that of Associate Member:

Lafleche, A.	Sutherland, C. C.
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Student:

McDonald, J. M.	
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August 1st, 1916.

Members:

Pillsbury, J. H.	Stockett, L.
Ruddick, J.	

Associate Members:

Armstrong, W. J.	Jackson, A. M.
Dion, A. H.	Lyons, M. A.
Eassie, W. H.	Mackenzie, J. R.
Gale, A. V.	Ritchie, D. W.
Gingras, E. P.	Trudel, A.
Graves, R. P.	

Juniors:

Cooper, R. H.	Perron, H. M.
Craig, H. C.	Wall, A. F.

Associate:

Lynch, F. C. C.

Transferred from the Class of Associate Member to that of Member:

Gayfer, A. J.	Parsons, W. R. W.
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Transferred from the Class of Junior to that of Associate Member:

Black, M. W.	McIntyre, A. G.
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Transferred from the Class of Student to that of Associate Member:

Hawkins, L. K.	Moyer, J. C.
Laframboise, A.	Munson, A. H.
Meadows, C. A.	Sheppard, N. E. D.

Transferred from the Class of Student to that of Junior:

Bowman, F.	McAllister, R. A.
Gnaedinger, F. T.	Prieur, H.
Griesbach, W.	Young, R. B.

Students:

Gardner, W. McG.	Underhill, J. L.
Lowe, E. J.	

September 19th, 1916.

Associate Members:

Baxter, G. S.	Parker, G. C.
Bissett, J. R.	

Transferred from the Class of Associate Member to that of Member:

Gordon, R. J.	Roberts, T. L.
MacPhail, W. M.	

Transferred from the Class of Junior to that of Associate Member:

MacNearney, C. A.	Smith, H. G.
Shanks, G. L.	

Transferred from the Class of Student to that of Associate Member:

Dickson, G. H.	McLean, E. B.
Loucks, R. W. E.	

Transferred from the Class of Student to that of Junior:

Ford, J. W. H.	Lalonde, J. A.
Garden, H. M. G.	Munro, W. A.

Students:

Anderson, G.	Way, W. R.
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October 17th, 1916.

Associate Members:

Black, D. T.	D'Aeth, J. B.
Clarke, F.	Ells, S. C.
Clarson, A. S.	Needs, C. R.

Associate:

Labrie, C. C.

Juniors:

Beaudoin, H.	Wells, E. E.
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Transferred from the Class of Associate Member to that of Member:

Aldinger, A. H.	Fyshe, T. M.
Davidson, W. A.	Garner, A. C.
Duff, W. A.	Heaman, J. A.

Transferred from the Class of Junior to that of Associate Member:

Ferguson, J.

Transferred from the Class of Student to that of Junior:

Caughy, J. E.	Grenier, H.
Gauvreau, J. R.	MacIsaac, D. F.
Goodman, F. I. C.	Wilson, N.

December 5th, 1916.

Associate Members:

Berg, H. E.	Morse, J.
Crossley, T. L.	Newell, F.
Gale, W. J.	Proctor, E. M.
Martin, L. A.	

Juniors:

Bews, D. W.	O'Donnell, J. G.
Hutcheson, W. B.	Rutledge, M. J.
Leger, A.	

Transferred from the Class of Associate Member to that of Member:

Marshall, M. H.	Wilkie, E. T.
Stiles, J. A.	

Transferred from the Class of Junior to that of Associate Member:

Marshall, J. A. P.

Transferred from the Class of Student to that of Associate Member:

Robertson, J.

Transferred from the Class of Student to that of Junior:

Hogarth, C. E.	Somers, N. L.
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Students:

Boulton, C. A.	Morrette, J. I.
Brown, W. G.	Ross-Ross, D. de C.
Cunningham, F. J.	

The following is a statement in regard to the members of the Society who have, so far as information has been received, enlisted for overseas service during the period of the war:—

Hon. Member	1
Members	67
Associate Members	290
Associates	3
Juniors	135
Students	182
<hr/>	
In all	678

Of these there have been killed in action or died of wounds:—

Members	4
Associate Members	14
Juniors	9
Students	6
<hr/>	
In all	33

GENERAL.

In accordance with the instructions of the Annual Meeting the Council, at an early date in the year, took measures to constitute the Committee on Society Affairs. Its election was completed on April 18th, and the Committee named as its Chairman Prof. H. E. T. Haultain on May 16th. A progress report of this Committee has been distributed to the membership.

The Council has, during the year, had occasion to consider the conduct of several members of the Society in connection with certain alleged offences. In three of these cases the members concerned were censured.

The Council has pleasure in reporting that a Provincial Division has been duly constituted under the provisions of By-law No. 56 in the District of Alberta, thus establishing the second Provincial Division within the Society.

Under the provisions of an Act of the Quebec Legislature members residing within the Province have been exempted from service as jurors.

Representatives of the Society were, by request, appointed and attended the Convention of the Western Canada Irrigation Association at Kamloops, B.C., and the International Irrigation Congress at El Paso, Texas, U.S.A. Mr. A. S. Dawson of Calgary represented the Society at the dedication of the Elephant Butte Dam near Engle, New Mexico, U.S.A.

A very considerable amount of time was occupied during the year in Council meetings and by specially appointed Committees in connection with the question of the employment of alien engineers by the Government. A general statement as to the position of this matter has recently been communicated to the membership. It is still under advisement and such further progress as may be made will be reported from time to time.

A circular letter has been addressed to Branches, pointing out that the interests of the profession in Canada will be served by giving attention to engineering matters of importance in the locality of the Branch. The Calgary Branch rendered an important service to the city in the early portion of this year by reporting on the construction of a bridge over the Bow River, in regard to the stability of which there was contention. This report completely exonerated the City Engineer from the aspersions cast upon him by an Alderman, and the action of the Branch met with the approval of the Board of Control and the citizens generally.

In Montreal the local members of the Council, during the autumn of 1915, made representations to the City's Board of Control as to the advisability of going forward with the aqueduct power project as designed. No action having been taken by the city authorities, a number of rate-paying engineers acting independently of the Society made

further representation and on the invitation of the city authorities made an exhaustive study of the project and presented a report which completely sustained the position taken by the local Council.

The Quebec Bridge excursion, in which the membership was invited to participate, was attended by upwards of 160 members of the Society and their friends.

The special funds in connection with which subscriptions have been received during the current year stand as follows:—

Fund in aid of families of members who have enlisted for active service in the army:—

Amount subscribed to Dec. 31, 1915.....	\$2,093.00
Amount subscribed during 1916.....	30.60
Total amount subscribed to date.....	\$2,123.60
Amount paid out to date.....	157.55

Balance, Dec. 31, 1916.....	\$1,966.05
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Canadian Engineers Hospital and Medical Comforts Fund:—

Amount subscribed to Dec. 31, 1915.....	\$703.45
Amount subscribed during 1916.....	19.51
Total amount subscribed to date.....	\$722.96
Amount paid to date.....	709.45

Balance, Dec. 31, 1916.....	\$13.51
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G. H. DUGGAN, President.

Dec. 31st, 1916.

C. H. McLEOD, Secretary.

REPORT OF THE LIBRARY AND HOUSE COMMITTEE.

MEMBERS OF COMMITTEE.

Frigon, A.	Shearwood, F. P.
Safford, H. R.	Surveyer, A.
Brown, S. P., Chairman.	

In view of the necessity of curtailing expenses, purchases have not been made in excess of the money presented to the library. These amounts are as follows:—

J. B. McRae, M.Can.Soc.C.E.....	\$14.11
C. H. Rounthwaite, A.M.Can.Soc.C.E.....	8.00
F. V. Dowd, Jr.Can.Soc.C.E.....	10.00
	\$32.11

The works which have been purchased are:—

Final Report of the Construction of the Los Angeles Aqueduct.

Cost of Urban Transportation Service, by F. W. Doolittle.

The Portland Cement Industry, by W. A. Brown.

Law Affecting Engineers, by W. V. Ball.

Contracts, Specifications & Engineering Relations, D. W. Meade.

Electric Railway Handbook, with order for Electric Railway Journal.

Proceedings of American Institute of Electrical Engineers, together with Transactions.

Presentations have been made as follows:—

By Members:—

By W. G. Bligh, M.Can.Soc.C.E.

“Dams and Weirs,” by W. G. Bligh.

By Phelps Johnson, M.Can.Soc.C.E.

“International Engineering Congress,” 1915. 13 vols.

“In Northern Mists,” by F. Nansen. 2 vols.

“Modern Copper Smelting,” by E. D. Peters, Jr.

“The Metallurgy of Lead,” by H. O. Hofman.

“The Metallurgy of Silver, Gold and Mercury in the U. S.”

Vol. 2, “Gold and Mercury,” by Thos. Egleston.

By A. Surveyer, M.Can.Soc.C.E.

“Code of Ethics and Professional Fees of the Graduates of École Polytechnique.”

By L. G. Van Tuyl, A.M.Can.Soc.C.E.

“Engineers’ Year Book for 1916.”

By Walter C. McLaren, Jr.Can.Soc.C.E.

“Engineering Geology,” by H. Ries and T. L. Watson.

By Non-Members:—

By the Commissioners.

“Report of the Michigan Railroad Commission for the years 1908, 1909, 1910, 1911, 1912 and 1913.”

By E. F. Murphy, Commissioner of Public Works.

“Annual Report, Public Works Department, City of Boston, for 1914.”

By Rand, McNally & Co., Chicago.

“Smoke Abatement and Electrification of Railway Terminals in Chicago.”

By M. H. Smith, Chief Engineer, New York City.

“Report of the Commission on Additional Water Supply for the City of New York,” by W. H. Burr, R. Hering and J. R. Freeman.

By W. A. Ryan, Acting Director, U.S. Reclamation Service, Washington, D.C.

“Annual Reports of the U. S. Reclamation Service,” Nos. 2, 3, 7, 8, 9, 10, 11, 12, 13 and 14.

By J. E. Chalifour, Chief Geographer, Dept. of the Interior, Ottawa.

“Atlas of Canada,” 1915 Edition.

By F. M. Williams, State Engineer and Surveyor.

“Annual Reports of the State Engineer and Surveyor of the State of New York,” for 1905, 1906, 1907, 1910, 1912, 1913, 1914.

“History of New York Canals,” 1905.

By L. B. Beale, B.C. Lumber Commissioner.

"B.C. Douglas Fir Dimensions."

"Western Soft Pine."

"Western Larch."

"Red Cedar Shingles."

"How to Finish B.C. Wood."

By E. F. Drake, Supt. Irrigation Branch, Dept. of the Interior, Ottawa.

"Report of Progress of Stream Measurements in Alberta and Saskatchewan."

By John Wiley & Sons, Inc.

"The Planning of the Modern City," by N. P. Lewis.

By the Topographical Branch, Dept. of the Interior, Ottawa.

"Report on Levelling Operations (1908-14), with a Summary of the Results," by J. N. Wallace.

By E. L. Powers, Secretary, American Road Builders' Association.

"Proceedings of the 9th, 10th and 11th Annual Conventions, American Road Builders' Association."

By E. F. Roeber, Editor, New York.

"Metallurgical and Chemical Engineering Journal."

By F. Rex, Municipal Reference Librarian, Chicago.

"Recommendations and General Plans for a Comprehensive Passenger Subway System for the City of Chicago," by B. J. Arnold.

"City of Chicago Report on Transportation Subways." 3 vols., 1909.

By the Commission.

"Report to the Civic Transportation Committee on Radial Railway Entrances and Rapid Transit for the City of Toronto." 2 vols.

The following additional exchanges have been effected:—

Contractors' Review.

Publications of Engineers' Club, St. Louis.

Institution of Water Engineers.

Northern Engineering Institute, New South Wales.

Institution of Radio Engineers, New York.

Journal of American Concrete Institute.

A special collection of literature bearing on the regulations relating to the employment of engineers by governments, states and cities is being compiled.

The technical magazines, transactions, etc., which have been received during the year are the same as those listed in the Report for 1914, together with the additions named above. They number in all 91. Of these, 73 are exchanges and 18 are paid for. 28 are marked for binding at the end of the year and are to be placed on the library shelves.

December 30th, 1916.

S. P. BROWN,

CANADIAN SOCIETY OF CIVIL ENGINEERS.
STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR ENDED 31st DECEMBER, 1916.

<i>Receipts.</i>		<i>Expenditure.</i>	
SUBSCRIPTIONS—		INTEREST ON MORTGAGE TO 31st DECEMBER, 1916	\$1,200.00
Arrears of Fees Collected.....	\$ 6,512.11	PRINTING AND STATIONERY, INCLUDING TRANSACTIONS	6,690.82
Current Fees	13,175.89	BOOKS, MAGAZINES, AND LIBRARY EXPENSES	30.94
Advance Fees	152.65	POSTAGE, POST CARDS AND TELEGRAMS.....	1,419.44
Entrance Fees	2,485.45	SALARIES OF SECRETARY AND OFFICE STAFF	4,015.45
NET REVENUE FROM ADVERTISEMENTS IN LIST OF MEMBERS	\$22,326.10	CARETAKERS' WAGES	1,165.00
INTEREST—		TAXES	1,105.77
Savings Bank Account.....	\$ 13.30	WATER RATES	194.00
Overdue Fees	415.49	EXPENSES—Annual Meeting	37.55
SALES OF TRANSACTIONS AND PERIODICALS		EXPENSES—Ordinary Meetings	143.53
DIVIDENDS—		COAL AND WOOD	395.89
Can. Per. & West. Can. Mtg. Corp. Stock	\$17.50	ELECTRIC LIGHT AND POWER.....	100.26
Montreal Light, Heat & Power Co. Stock	21.00	GAS	29.80
		REPAIRS AND HOUSE SUPPLIES.....	108.38
		INSURANCE	19.50
		TELEPHONE—Rent and Tolls	74.89
		CABS, CARTAGE, ETC.....	4.10
		SUNDRIES	111.53
		AUDITORS	200.00
		BANK COMMISSION	39.58
		LEGAL EXPENSES	240.96
Forward	\$23,726.94	Forward	\$17,327.39

CONTINUATION OF

STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR ENDED 31st DECEMBER, 1916.

<i>Receipts.</i>		<i>Expenditure.</i>	
Carried Forward	\$23,726.94	Carried Forward	\$17,327.39
		EXAMINATIONS—Less Receipts	27.00
		EXPENSES OF COMMITTEES	276.25
		REBATES OF FEES TO BRANCH SOCIETIES—	
		Toronto	\$473.50
		Quebec	252.50
		Winnipeg	393.50
		Ottawa	676.50
		Vancouver	250.00
		Victoria	149.50
		Calgary	117.00
		Regina	51.00
		Edmonton	90.75
			2,454.25
		TOTAL EXPENDITURE ON REVENUE ACCOUNT	\$20,084.89
		BALANCE—being Excess of Receipts over Expenditure for year ending 31st December, 1916	3,642.05
			\$23,726.94

Montreal, 11th January, 1917.

Verified, RIDDELL, STEAD, GRAHAM & HUTCHISON, C.A.,
Auditors.

CANADIAN SOCIETY OF CIVIL ENGINEERS.
STATEMENT OF ASSETS AND LIABILITIES AS AT 31st DECEMBER, 1916.

<i>Assets.</i>		<i>Liabilities.</i>	
PROPERTY ACCOUNT	\$89,041.64	PRIZE FUND ACCOUNT	\$ 468.77
FURNITURE—		ROYAL INSTITUTION FOR THE	
Balance at 31st December, 1915.....	\$2,758.77	ADVANCEMENT OF LEARN-	
Less 10% written off for Deprecia-		ING—	
tion	275.87	Mortgage on Mansfield St.	
		Property at 6%	\$20,000.00
Books—Estimated value	2,482.90	Interest accrued thereon to	
ARREARS OF FEES—Estimated value.....	6,280.00	date	200.00
CANADA PERMANENT & WESTERN CAN-	5,000.00		
ADA MORTGAGE CORPORATION STOCK			20,200.00
MONTREAL LIGHT, HEAT & POWER Co.	180.00		5,409.65
STOCK	120.50	ACCOUNTS PAYABLE	1,659.75
GOLD MEDAL	45.00	SUNDRY REBATES DUE TO	
ACCOUNTS RECEIVABLE FOR ADVERTISING		BRANCHES	
(Net)	73.00	SURPLUS—	
CASH ON HAND AND IN BANK.....	10,698.68	Balance at 31st December,	
PETTY CASH ON HAND.....	77.17	1915	\$82,864.54
		Add Receipts on Revenue	
		Account	\$23,726.94
		Less Expenditure on Rev-	
		enue Account	20,084.89
			3,642.05
			\$86,506.59
Forward	\$113,998.89	Forward	\$27,738.17

CONTINUATION OF
STATEMENT OF ASSETS AND LIABILITIES AS AT 31st DECEMBER, 1916.

<i>Assets:</i>	
Carried Forward	\$113,998.89
<i>Liabilities.</i>	
Carried Forward	\$27,738.17
Estimated value of Books added to Library.....	30.00
	<hr/>
	\$86,536.59
Less written off for Deprecia- tion on Furniture	275.87
	<hr/>
	\$86,260.72

\$113,998.89

Montreal, 11th January, 1917.

Verified, RIDDELL, STEAD, GRAHAM & HUTCHISON, C.A.,
Auditors.

\$113,998.89

Obituaries

AYLEN, JOHN, M.Can.Soc.C.E., was amongst those who joined the Society on its formation, the date of his admission being February 24th, 1887. He was a graduate of Cornell University where the degree of B.C.E. was conferred upon him. During the years 1887 to 1891 he was engaged in private practice in Aylmer, Quebec. In 1892 he took a position in connection with public works at Morrisburg, Ontario. The next year he again returned to his old home in Aylmer, and for some years thereafter he resided at Britannia Bay, Ontario. In 1907 he became assistant engineer on the Transcontinental Railway with headquarters at North Bay, Ontario. From 1910 to 1913 he was engaged in private consulting practice, first at North Bay and afterwards at Mistatim, Saskatchewan. In 1914 he moved his residence to Norway House, Manitoba, where he continued to reside until his death, which occurred on October 17th, 1916.

BARROW, ERNEST GEORGE, M.Can.Soc.C.E., O.L.S., was born at Clifton, England, in 1846. From 1863 to 1866 he was articled to Francis Fox, M.I.C.E., Chief Engineer, Bristol and Exeter Railway, and from 1866 to 1871 he was assistant engineer on the Cheddar Valley Railway. In 1871 he came to Canada and was employed on the construction of the Midland Railway of Canada. From 1872 to 1874 he made preliminary surveys for the Hamilton and Northwestern Railway (now the Grand Trunk Railway). Entering the service of the City of Hamilton Corporation he was employed in making profiles for sewers, grading, etc. In 1876 he obtained his certificate as Provincial Land Surveyor. In that year he rejoined the staff of the Hamilton and Northwestern Railway Company and was placed in charge of the construction of part of the line near Duntroon. From 1879 to 1887 he was employed by the Corporation of Hamilton on various city works, and also was in private practice. He made plans for a new sewerage system in Hamilton which were approved and adopted by the Corporation. In the course of his private practice he designed and constructed the water works for several Ontario towns and of various public and commercial buildings. In 1890 he was appointed Deputy City Engineer for the City of Hamilton.

Mr. Barrows had the distinction of assisting in the construction of the first sewage disposal works in Canada, in the building of the first concrete reservoir and in the introduction of tar macadam roads.

He died in July, 1916, after a long illness.

BERLINGUET, FRANCOIS XAVIER, M.Can.Soc.C.E., was born at Québec in 1830. He first studied architecture and sculpture and obtained several first prizes for statuary works in wood; one of these securing a first prize diploma and a medal at an exhibition held in Montreal in 1860. In 1852 he opened an office in Québec as architect and contractor and built numerous churches. In 1869 he studied to become a civil engineer and railway contractor. From 1870 to 1876 he acted as engineer for the contractors on the Intercolonial Railway from Restigouche to Bathurst, and later as expert for the contractors in their claims against the Government. In 1874 he submitted competitive plans and specifications for the Québec harbour works, and in 1883 similar plans for the Québec waterworks. Mr. Berlinguet was appointed City Engineer of Three Rivers, Québec, in 1886.

He died at Québec City on August 3rd, 1916.

BOWMAN, HERBERT JOSEPH (Colonel), M.Can.Soc.C.E.; D.L.S. O.L.S., was born at Kitchener (Berlin), Ontario, in 1865. In 1885 he received the degree of C.E. from the University of Toronto. On the outbreak of the Northwest Rebellion, while Mr. Bowman was a student at the University, he joined the Queen's Own Regiment and took part in quelling the rebellion. On account of his experience gained and services rendered at that time he was promoted to be Colonel of the 108th Regiment on the outbreak of the present war. In 1887 Colonel Bowman began private practice in his home town, specializing in waterworks construction, engineering plants and bridges. For some years he was secretary-treasurer and superintendent of the firm of Moffatt, Hodgins & Clarke, of Kitchener, Ontario. In 1891 he made sewerage plans for the City of Kitchener under C. H. Rust, M.Can.Soc.C.E., built main sewers and was appointed Town Engineer. The new electric pumps, the cement reservoir and the sinking of wells at Bridgeport for securing a future water supply for the city were improvements suggested by Colonel Bowman, who was consulting engineer and a member of the Water Commission appointed in 1899. He also engineered the waterworks plants at Hespeler, Listowel, Elmira, Fergus, Chesley, Norwich and Parkhill. In 1896 he succeeded his father as county clerk. On the outbreak of the war Colonel Bowman organized the 108th Regiment from which were drafted the majority of the officers and over 250 of the men of the 118th Battalion. He was only prevented from going overseas himself by his illness.

He died on June 19th, 1916.

CARMAN, GUY COLMAN, M.Can.Soc.C.E., was born at Cornwall, Ontario, in 1836. During the first thirteen years of his work, Mr. Carman was employed mainly on the Atlantic & Great Western Railway, the Chicago & Grand Trunk Railway, Intercolonial Railway, Grand Junction Railway at Belleville, Ontario, and the Canadian Pacific Railway on surveys and on construction work. From 1873 to 1880 he was assistant engineer on various surveys on the Beauharnois Canal, Lake St. Louis, Montreal and vicinity, and on the proposed feeder for the Cornwall Canal. In 1880 he became assistant engineer with the Canadian Pacific Railway on location and construction chiefly in British Columbia. From 1887 to 1889 he was assistant engineer on the Seattle, Lake Shore & Eastern Railway, Washington, U.S.A. For some months he was assistant to the City Engineer of Seattle in charge of bridge and trestle work, and later on construction work for the Union Pacific Railway, Seattle. From 1891 to 1897 he was assistant engineer on the Cornwall Canal enlargement, including the large dams at Milleroches and Dickenson's Landing, from 1897 to 1898 resident engineer on Farrans Point Canal enlargement, and from 1898 resident engineer on the Iroquois section of the Galops Canal enlargement.

He died at Cornwall on on January 21st, 1916.

CORTHELL, ELMER LAWRENCE, M.Can.Soc.C.E., was born at South Abington, Mass., U.S.A., in 1840. He graduated from Brown University in 1867 and received the degrees of A.M. in 1868 and of Sc.D. in 1894. He served for four years in the 1st Battery, R.I. Light Artillery, rising from the rank of private to that of Captain. He began his civil engineering experience at Providence, R.I., in 1867, and during the next thirty years served on railway construction and surveys in Illinois and Missouri, as chief engineer on bridges over the Mississippi River at Hannibal and Louisiana, Mo., and on Long Island levee, as resident engineer on Mississippi jetties, as chief engineer on the Tehuantepec ship railway, Mexico, and on the construction of the New York, West Shore & Buffalo Railway, as consulting engineer for railways into Chicago, as associate chief engineer for several large bridges over the Missouri, Ohio and other rivers, and as chief engineer of the Merchants Bridge at St. Louis, the Brazos River jetties in Texas, and of the Tampico harbour works, Mexico. From 1900 to 1902 Mr. Corthell was consulting engineer for the National Public Works, Argentine Government.

Mr. Corthell was Chairman of the Commission of the International Engineering Congress at Chicago in 1893, the United States delegate and Vice-President of the International Navigation Congress at Brussels in 1898, and the delegate of the Argentine

Government to the International Navigation Congress at Dusseldorf in 1902; he was also the United States Government member on the Permanent Commission of the same. He was a member of many American and foreign engineering societies; some of them being the American Society of Civil Engineers, of which he was President in 1888, Western Society of Engineers of which he was President in 1889, Canadian Society of Civil Engineers, Institution of Civil Engineers (Great Britain), Société des Ingenieurs Civils (France), of which he was also corresponding member, and the National Geographical Society. He was also a member of several fraternities and military societies as well as of the Advisory Board of Consulting Engineers of New York State, and chief engineer of the Port of Para, Brazil, and Rio Grande do Sul.

Among Mr. Corthell's literary works may be mentioned:—History of the Mississippi Jetties, 1880; Report on Brussels Navigation Congress, 1898; Maritime Commerce, Past, Present and Future, 1898; Some Ports of the World (Paris Navigation Congress) 1901; articles on jetties, levees, ship canals, ship railways, etc., Johnson's Cyclopedia.

He died on May 16th, 1916.

CREIGHTON, FRANK ALBRO (Lt.-Col.), M.Can.Soc.C.E., was born at Dartmouth, N.S., in 1875. He was educated at Halifax Academy. From 1891 to 1893 he was rodman and assistant on Dartmouth water and sewerage works, and from 1894 to 1898 was employed on various engineering and surveying works, receiving a commission as Deputy Land Surveyor in 1896. From 1899 to 1901 he was assistant engineer with the Dominion Coal Company and the Dominion Iron and Steel Company, and during 1901 was employed on various surveys. In 1902 he entered the service of Mackenzie, Mann & Company, and was chief of party on preliminary and location surveys on the Halifax & South Western Railway, the eastern extension of the Canadian Northern Railway and on James Bay Railway. In 1905 he became division engineer on construction of the latter. Shortly afterwards he became city engineer of Prince Albert, Sask., and served in that capacity until 1912, when he went to Vancouver and was employed on the construction of a dam and water power. In 1913 he went to Winnipeg and was engaged in private practice until the outbreak of the war, when he went to the Front with the 1st Canadian Contingent as a Lieutenant in the Corps of Guides. He received the Cross of the Legion of Honour from the French Government and was promoted to the rank of Lieutenant-Colonel.

He died of wounds received in the service of his country in August, 1916.

GIBSON, PETER SILAS, M.Can.Soc.C.E., was born in 1837. He was one of the first members of the Society, joining on January 20th, 1887. He graduated from the University of Michigan in 1864. After graduation he followed his profession of land surveyor and civil engineer until shortly before his death. For thirty-five years he was engineer for the Township of York, Ontario, and was also engineer for several other municipalities, designing and constructing roads, bridges, sewers and other public works. In 1873 he was appointed a member of the Board of Examiners of Provincial Land Surveyors for Ontario, retaining this membership until a few years ago.

He died at his home, Willowdale, Ontario, on August 7th, 1916.

GREENWOOD, HENRY SMITH (Lt.-Col.), M.Can.Soc.C.E., was born in Ontario in 1861. He graduated from the Royal Military College, Kingston, in June, 1882, receiving a diploma with special mention in civil engineering. He began his professional career as rodman on the Canada Atlantic Railway, and was subsequently employed by the Department of Railways and Canals as rodman and leveller on the construction of the Trent Canal. In 1889 he was appointed assistant engineer on the Cornwall Canal enlargement, and in 1892 became resident assistant engineer on the same work, supervising three sections. In 1894 he was transferred to the Peterborough and Lakefield Division of the Trent Canal, taking charge of the surveys and preparing plans for the Division.

Lieut.-Colonel Greenwood held a Royal School of Infantry first-class certificate and the long service decoration. In 1886 he was Captain and Adjutant in the 4th Hussars, in 1889 was Lieut.-Colonel of the 3rd Dragoons and went on the reserve of officers in 1907. He served in the South African war in 1900 and in the native rebellion in Natal in 1906. After the entry of the British into Johannesburg, he was appointed to reorganize the railways in the Transvaal, and later was placed in charge of lines in the western Transvaal and northern Orange River Colony. On the conclusion of the Boer War he organized and commanded a railway regiment from amongst the officials and employees of the Central South African Railways, which was so well equipped and disciplined that during the Zulu rebellion drafts were sent from it to reconstruct and build the railways. In 1909 he returned to Canada, and in 1910 was appointed assistant chief engineer of construction of the Eastern Lines, Canadian Northern Railway, resigning in 1914 to live in England. On the outbreak of the war and until his last illness he was engaged at the War Office, London. In 1904 he became a member of The Institution of Civil Engineers.

He died on May 15th, 1916.

KUNZ, FREDERIC CHARLES, M.Can.Soc.C.E., was born at Prague, Austria, in 1862. He graduated from the University of Prague in 1886 as a civil engineer. From 1886 to 1891 he was assistant engineer on the Austrian Northern Railway in Vienna. From 1891 to 1893 and from 1896 to 1900 he was assistant engineer, bridge and construction department of the Pencoyd Iron Works, Philadelphia, U.S.A. From 1893 to 1896 he was assistant engineer of the Bureau of Surveys for the City of Philadelphia, and from 1900 to 1903 assistant to the Vice-President in charge of Engineering of the American Bridge Company, when the Pencoyd Iron Works was absorbed by this company. In 1903 he was appointed consulting engineer of the bridge department of New York City, assisting in the preparation of specifications and plans for the Manhattan and Queensboro bridges. In 1904 he resigned to become chief engineer of the Pennsylvania Steel Company at Steelton, Pa. In 1909 he entered private practice as a consulting engineer principally on bridge work. He was associated with Mr. C. C. Schneider on the St. John River bridge at St. John, N.B. During this period he devoted a considerable portion of his time to the writing of his book on "Design of Steel Bridges."

He died on May 3rd, 1916.

MANN, WILLIAM EDWARD, M.Can.Soc.C.E., was born at Nieuville, Que., in 1864. He was a graduate of Queen's University, Kingston. From 1897 to 1900 he was engaged on bridge work on the Crow's Nest Pass Railway for the Canadian Pacific Railway. Later he was engaged on location for the Canadian Northern Railway between Winnipeg and Fort William, and was in charge of location parties on the Manitoulin and North Shore Railway in Northern Ontario. In 1904 he joined the staff of the Grand Trunk Pacific as locating engineer, later he was appointed district engineer at Winnipeg and then inspecting engineer on the Transcontinental Railway representing the Grand Trunk Pacific on that portion of the construction. In 1909 he was promoted to be division engineer with headquarters at Edmonton. It is greatly to his credit that the long sweeping tangents and easy gradients that are a portion of the Prairie Division of this railway were largely attributable to his efforts. In 1912 he resigned his position and was appointed chief engineer of the Edmonton, Dunvegan & British Columbia Railway, which he also resigned after a few months to enter private practice. One of his most important cases was representing the Transcontinental Railway Commission in its suit with the Canadian Northern Railway over the property and

terminal damages of the entrance of the former railway at Winnipeg.

He died on March 30th, 1916.

MCWOOD, WILLIAM, M.Can.Soc.C.E., who was born in Montreal in 1830, was one of the original members of the Society, having been admitted on February 3rd, 1887. He first served as articled apprentice to John Thornton, carriage builder, and in 1855 entered the service of the Grand Trunk Railway as foreman in the car department. In 1860 he was made assistant mechanical superintendent of the same department, and was in charge as superintendent for the entire line from 1873 to 1908. He took an active part in the organization of the Master Car Builders' Association, and was a member from 1875. From 1882 to 1887 he was its Vice-President, and from 1888 to 1890 its President.

He died on October 4th, 1916, after a long illness.

OSLER, CHARLES HODGSON, M.Can.Soc.C.E., was born at Great Driffield, Yorks, England, in 1860. He joined the Society as an Associate Member on May 12th, 1887, soon after its formation, and was transferred to the grade of Member on December 23rd, 1892. He began his career with the Kingston and Pembroke Railway, then was with the Napanee, Tamworth & Quebec Railway on surveys, and had charge of a location party, Delta to Farmersville, for the Brockville, Westport & Sault Ste. Marie Railway. From 1886 to 1889 he was engaged on the Pontiac-Pacific Junction Railway and the Ottawa & Gatineau Valley Railway on location and surveys. After this he went west for the Canadian Pacific Railway as engineer in charge of locations on western lines, and for the Canadian Northern Railway, and also did some exploration work for the Hudson Bay Railway. He finally returned to Montreal and joined the staff of the Montreal Light, Heat & Power Company.

He died on July 8th, 1916.

REYNOLDS, SAMUEL HENRY, M.Can.Soc.C.E., P.L.S., was born at Oswego, U.S.A., in 1859. He was educated at St. Catharines, Ontario, and served as a land surveyor's apprentice to Mr. E. Gardiner of that city, being admitted to practice as a Provincial Land Surveyor in Ontario in 1880. In 1885 he was contractor's engineer on the Welland Canal enlargement, and in 1886 and 1887 on the gas holder tank at Toronto. In 1887 he designed and constructed the first water system for Merriton, Ontario, and in 1888, while 'City Engineer' for St. Catharines, supervised the extensions of and improvements in the water system of that city. In 1889 he was contractor's engineer and superintendent of construction of locks and dams Nos. 7 and 11, Great Kanawaka River improvement.

From 1889 to 1897 he was contractor's engineer and in charge of construction on lock No. 2, Ohio River improvement. From 1898 to 1900 he was mining engineer and manager for the Great Granite Gold Mining Company, Lake of the Woods. From 1901 to 1908 he was assistant to the City Engineer, Winnipeg, and from 1908 to 1913 resided in Victoria, B.C., first as Managing Director of the Pacific Coast Coal Mines, Ltd., and afterwards as a consulting engineer. From October, 1913, until his death, he was Chairman of the Commissioners of the Greater Winnipeg Water District.

He died on June 16th, 1916.

ROY, ROBERT MAITLAND, M.Can.Soc.C.E., was born at Stirling, Ont., in 1869, and educated at Belleville, Ontario. From 1886 to 1888 he was with the engineering department of the Grand Trunk Railway. From 1888 to 1892 he was connected with the Brown Manufacturing Company, Belleville, as draftsman and inspector of Government and railway supplies, etc., also on Government surveys of Belleville harbour and river protection works, and on extensions to the Belleville waterworks. From 1892 to 1898 he was employed as inspector, draftsman, estimator and engineer for highway and railway bridges by the Central Bridge & Engineering Company of Peterborough, and from 1898 to 1916 was connected with the Hamilton Bridge Works as engineer in charge of highway work, and later as manager.

He died on June 27th, 1916.

STOESS, CHARLES ANTHONY, M.Can.Soc.C.E., was elected an Associate Member of the Society in 1891, and was transferred to the grade of Member in 1892. He died at Vancouver in July, 1916.

Mr. Stoess was a prominent member of the Society and intimately associated with engineering work in British Columbia. Unfortunately a detailed statement as to his career is not at hand, but it is hoped that a proper obituary notice of him will be available for publication at a later date.

TAYLOR, DANIEL, M.Can.Soc.C.E., was born at Waterloo, Que., in 1864. He was educated at McGill University and graduated with the degree of B.A.Sc., in 1887. His first engineering appointment after graduation was on the construction of the Duluth, South Shore & Atlantic Railway. For a few months during 1888 he was assistant engineer with the firm of Spalding & Lowe, engaged chiefly on surveying work. For four years afterwards, 1888 to 1892, he was in private practice on surveying and municipal work at Minneapolis. During the year 1892 he was engineer on the construction of the Minneapolis, St. Paul and Sault Ste. Marie Railway, and in the latter part of that year was in charge of the con-

struction of foundations for the Great Western elevator at Minneapolis. In 1893 and 1894 he was in charge of several important pieces of work for the Great Northern Railway. From 1895 to 1897 he was chief engineer of location and construction for the Minneapolis, St. Paul & Ashland Railway. Leaving that road, he became resident engineer in charge of the construction of a portion of the Great Northern Railway. For the years 1898 to 1901 he resumed his connection as chief engineer of location and construction for the Minneapolis, St. Paul & Ashland Railway. During the years 1901 and 1902 he was in charge of construction for the Great Northern Railway on one of the mountain divisions, and in the following year became locating engineer for the Wisconsin Central Railway. In 1904 he again became resident engineer on construction for the Great Northern Railway with which road he retained his connection up to the time of his death, having an office at St. Paul, Minn. During the latter years of his life, however, he was in delicate health and worked for only a portion of each year, making his winter home in Sierra Madre, California.

He died on December 23rd, 1916.

WILLIAMS, DAVID, M.Can.Soc.C.E., was born at Holyhead, North Wales, February 6th, 1854. He was elected a Member of the Society on March 11th, 1897. When still an infant he was brought to Richmond, P.Q., where his father was engineer of construction on what is now the Grand Trunk Railway. His early education was in the public schools at Richmond, P.Q., and St. Francis College. He served as Lieutenant in the Light Infantry, being stationed at Quebec where he took a course in military training. From 1874 till 1882 Mr. Williams was associated with Mr. H. C. Cleveland, a prominent railway locating engineer of the Eastern Townships. In 1882 he joined the engineering staff of the Canadian Pacific Railway, being assigned to the Northwest Lake Superior Division, in which Division he remained until 1886. During his employment with the Canadian Pacific Railway he had charge of the location of some 200 miles of track around the Great Lakes. In 1886 he was appointed chief engineer of the Drummond County Railway, now a part of the Intercolonial Railway System, and resigned from that position in 1887 to accept the office of locating engineer of the Hereford and Upper Coos Railway, now a part of the Maine Central Railway System. After completing his work as Locating Engineer, Mr. Williams had charge of the construction and built nearly 100 miles of road into the extensive lumber regions of the Eastern Townships. He became Chief Engineer of the road. In March, 1890, he was appointed road master of the Western Division of the Boston and Maine Railroad. In 1891 he was appointed assistant to the chief

engineer, which position he held until 1893, when he became division engineer with headquarters in St. Johnsbury, Vt. He served as division engineer from 1893 until he retired from railroad engineering in 1911. During his connection with the Boston and Maine Railroad Mr. Williams had charge of the double tracking of the Vermont Valley Railroad and the Sullivan County Railroad. After his resignation from the Boston & Maine Railroad he had charge of the separation of grades in the Revere Beach and Lynn Railroad. In 1912 he was appointed chief engineer of E. & T. Fairbanks and Company's scale manufacturing plant at St. Johnsbury, Vt., and had entire charge of the construction of the extension additions to its home plant. At the time of his death at St. Johnsbury, Vt., on November 27th, 1915, Mr. Williams was employed by the State of Vermont as consulting engineer to the Public Service Commission and the State Highway Commission.

AGNEW, AUGUSTUS WATEROUS (Major), A.M.Can.Soc.C.E., was born in Montreal in 1884. He was educated at the Royal Military College, Kingston, Ont., and the Crystal Palace Practical School of Engineering, London. His first professional work was as rodman with the Canadian Pacific Railway. In 1906 he joined the staff of the Grand Trunk Pacific Railway as instrumentman, becoming resident engineer in charge of townsite surveys, Prince Rupert, in 1908. Six months later he was made resident engineer on municipal improvement of sewers, Prince Rupert. He remained in this position only a short time before entering private practice as engineer and surveyor with Mr. J. F. Ritchie, B.C.L.S. and D.L.S.

On the outbreak of the war Mr. Agnew joined the 48th Battalion, Canadian Pioneers, and went to England in June, 1915, as Captain and Adjutant of that Battalion. Later he was given his majority in recognition of the work he had done.

He died of wounds in France on September 19th, 1916.

AUCLAIR, H. L., A.M.Can.Soc.C.E., joined the Society on October 11th, 1898. At that time he was assistant city surveyor for the City of Montreal, being engaged in supervising paving construction and making street surveys. In 1912 he was appointed engineer-in-charge of the Northern Division Road Department in which capacity he carried out the construction of a considerable mileage of new pavements and sidewalks. In 1915 he was put in charge of the street lines and levels branch of the Road Department, which position he occupied until his death in April, 1916.

BRADSHAW, WALTER EVERETT, A.M.Can.Soc.C.E., was born at Moncton, N.B., in 1887. He graduated from McGill University in 1909, receiving the degree of B.Sc. From 1909 until his death he

was connected with the Dominion Bridge Company as detail draftsman, checker and later in the designing department. In 1913 he was sent as resident engineer representing his company for the St. John arch bridge over the Reversible Falls, and was in charge of that work as well as some other work in St. John and vicinity where the Dominion Bridge Co. was erecting steelwork. On his return to Montreal in 1915 he was employed in the designing office until May when he was sent to the National Bridge Company plant as manager of the structural steel business. When the National Bridge Company became part of the Ammunition Company, Mr. Bradshaw was retained as acting manager during the installation of all the plant and the actual commencement of shell output.

He died on December 11th, 1915.

CHRISTIE, RYERSON MYERS (Lieut.), A.M.Can.Soc.C.E., was born at Island Brook, Que., in 1888. He graduated from the University of Toronto in 1914. Previous to graduation he spent two years in minor positions with the National Transcontinental Railway and two and a half years with Messrs. Driscoll & Knight, surveyors and engineers, Edmonton. His vacations during the period of his attendance at the University of Toronto were spent on various kinds of surveying and engineering work, in 1913 being in charge of street car grading and paving for the Worswick Paving Company, Edmonton. After graduation Mr. Christie was in private practice in Kamloops, B.C. In November, 1914, he went to England and received a commission as Lieutenant in the Scottish Rifles (Cameronians), being with their 1st Battalion when he was killed on July 15th, 1916, at High Wood in the battle of the Somme.

CURRIE, ARCHIBALD, A.M.Can.Soc.C.E., was born at Glasgow, Scotland, in 1869. From 1885 to 1890 he served his pupilage with Messrs. Crouch & Hogg, civil engineers, Glasgow. On the completion of his apprenticeship he was assistant engineer on construction of the West Highland Railway, and two years afterwards on the Imperial Railways of Northern China. In 1895 he became resident engineer in charge of construction and maintenance of the road from Tientsin to Peking. Between 1900 and 1902 he was in charge of the construction of a railway 160 miles in length in Cape Colony, South Africa, for the Cape Government. From 1902 to 1904 he was division engineer for the Central South African Railways, having charge of the survey and construction of some 240 miles of road in the Transvaal and Orange River Colonies. From 1904 to 1908 he was roads engineer to the Municipality of Johannesburg, having charge of electric tramway construction,

roads, bridges and drainage. Returning to Scotland in 1908 he was for three years engineer for the water supply to Clydebank, Scotland, and Swansea, Wales. During this period he was also connected with drainage work at Belfast. He came out to Canada in 1911 and became city surveyor at Westmount, Que., a position which he occupied until the autumn of 1913, when he was appointed city engineer of Ottawa.

He died at Ottawa on February 5th, 1916.

DANN, EYRE MORTON (Lieut.), A.M.Can.Soc.C.E., was born at Limerick, Ireland, in 1887. He graduated from the University of Toronto in 1909. Mr. Dann spent all of his professional career in the service of the Water Power Branch of the Department of the Interior. During the summer of 1911 he was assistant engineer in charge of the surveys on the Winnipeg River, and in the fall of that year was transferred to head office. The following summer he went to British Columbia as assistant engineer on the railway belt hydrographic survey. When the British Columbia hydrographic survey was organized in 1913 he was placed in charge of the Kamloops Division as division engineer, which position he held until he joined the 72nd Battalion of Seaforth Highlanders of Canada as a Lieutenant. He died of wounds on November 2nd, 1916.

DAVIS, GEORGE HOUGHTON (Sapper), A.M.Can.Soc.C.E., was born at Toronto in 1884. He graduated from McGill University in 1907, obtaining the degree of B.Sc. For two years after graduation he was on the staff of the Dominion Steel Corporation doing exploration work in Cape Breton. In 1910 he became assistant to Mr. W. B. Ford, surveying, prospecting and developing iron areas in Venezuela for the Canadian Venezuelan Ore Company, Limited. In 1912 he returned to Canada and joined the staff of the Canadian Pacific Railway as a draftsman in the division engineer's office. Leaving this position, he took up ranching at Milner, B.C. Joining the 5th Infantry Brigade as a private, he was promoted to lance-corporal while at Ottawa and to corporal in England. Later he transferred to the Signal Service of the Engineers 5th Infantry Brigade and was killed in action on April 30th, 1916.

EVANS, ALEXANDER EASSON (Lieut.), A.M.Can.Soc.C.E., was born at Stratford-on-Avon, England, in 1872. He graduated from Heriot-Watt College, Edinburgh, obtaining four medals in engineering subjects. From 1891 to 1896 he was articled to certain engineering and shipbuilding firms in Scotland. In 1897 he was appointed principal assistant to Mr. J. H. W. Park, A.M.I.C.E., of the Clarkson-Stanfield Ore Reduction Company, London, England. Later he spent some months as mechanical engineer to the Central

Boulder Mine, Kalgoortie, West Australia. From 1905 to 1909 he was in private practice in British Columbia as a consulting mechanical engineer. In 1909 he was appointed city engineer of Ladysmith, B.C., in charge of sewer construction.

When war was declared, Mr. Evans joined the 50th Gordon Highlanders, but transferred to the 30th Battalion and left with that unit in February, 1915, his rank being that of corporal. In England he was drafted into the 7th Battalion, and for services in the field was given a commission as 2nd Lieutenant. Shortly afterwards he was promoted to the rank of 1st Lieutenant, and was transferred to No. 2 Field Company of the Canadian Royal Engineers.

He was killed in action on January 6th, 1916.

HAFFNER, HENRY JOHN ALEXANDER (Lieut.), A.M.Can.Soc.C.E., was born at Guelph, Ont., in 1880. He graduated from McGill University in 1904 with the degree of B.Sc. Mr. Haffner was on the staff of the Canadian Pacific Railway for some years, part of the time being employed as divisional engineer on the construction of the irrigation canal near Calgary, Alta. He left that company to join the firm of Smith, Kerry & Chace, with whom he remained for about two years, and then started private practice in Vancouver. He constructed the power dams at Revelstoke and Nanaimo, and also a power dam and irrigation works near Vernon, B.C., as well as minor irrigation projects in the same district.

When war broke out he joined the 48th Seaforth Highlanders of Canada and was in charge of the Machine Gun Section, going to England with his Battalion in 1915. He was shot by a sniper at Ypres on the night of May 30th, 1916, and died the next morning.

HICK, HAROLD CRISPIN (Lieut.), A.M.Can.Soc.C.E., was born at New Ferry, England, in 1883. He was educated at Liverpool College and University and later was articled to Mr. T. H. Harrisson, Liverpool. Coming to Canada he entered the service of the Atlantic, Quebec & Western Railway as instrumentman. From 1907 to 1909 he was with the Transcontinental Railway as draftsman, transitman and assistant engineer. From 1909 to 1911 he was resident engineer and chief of survey party for the Ha! Ha! Bay Railway, Chicoutimi, Que. In 1911 he was appointed engineer of the Jonquieres Pulp Company, laying out town sites and designing sewage and water works for the same. On the outbreak of war he returned to England and received a commission as Lieutenant in the King's Liverpool Regiment. He was killed in action on July 11th, 1916.

OTTY, GEORGE N. DICKSON (Lieut.), A.M.Can.Soc.C.E., was born at Hampton, N.B., in 1885. In 1907 he graduated from McGill University with the degree of B.Sc. Mr. Otty's first engineering experience was gained as assistant on the installation of the waterworks extension, St. John, N.B., in 1905. After graduation he entered the service of the Canadian Pacific Railway as draftsman. In 1908 he was in charge of the erection of reinforced concrete arch bridges at St. Thomas, Ont., for J. A. Bell. In 1909 he was appointed town engineer of Rainy River, Ont., and in 1910 became superintendent for Geo. H. Archibald & Company, engineers and contractors, Winnipeg. In 1910 he again joined the Canadian Pacific Railway as inspector at Winnipeg, and later as assistant engineer at Fort William in charge of the foundations for the Strauss trunnion bascule bridge over the Kaministiquia River and for the Scherzer rolling lift bridge over the McKellar River. He went overseas with the 6th Canadian Mounted Rifles, and was killed in action in June, 1916.

PERLEY, GEORGE EDWIN, A.M.Can.Soc.C.E., was born at Shediac, N.B., in 1857. His first engineering work was in connection with surveys in New Brunswick for the Department of Public Works. From 1876 to 1880 he was a cadet at the Royal Military College, Kingston, and after completing this course he was engaged on the engineering staff of the Chicago, Burlington & Quincy Railway for four years. Returning to Canada in 1884 he accepted a position with the Public Works Department at Ottawa. From 1887 to 1892 he was assistant engineer on the construction of the dry dock at Kingston, Ontario, and during this period he carried out an important series of tests on the cement used on the work. On his return to Ottawa he was put in charge of the Cement Testing Bureau, a position which enabled him to continue his researches in connection with the advancement of the cement industry.

He died on March 16th, 1916.

VANSITTART, GEORGE EDWARD (Major), A.M.Can.Soc.C.E. In the death of Major G. E. Vansittart, 13th Battery, 4th Canadian Field Artillery Brigade, on May 14th, 1916, another name was added to the list of the brave men from amongst our members who have given up their lives while engaged on active service. A graduate of the Royal Military College as well as of McGill University, and descended from a long line of naval and military ancestors on both sides, it was natural that this gallant officer, then residing in the United States, should return to Canada where he enlisted as a subaltern in the Field Artillery.

The late Major Vansittart was the only son of John Pennyfather Vansittart, Public Works Department, India, where he was born at Mussooree in October, 1884. His great grandfather and uncle on his father's side were admirals in the British Navy. His great grandfather on his mother's side was Colonel Alexander Light, who commanded with distinction in India and elsewhere the 25th Queen's Own Borderers.

The first two years of Major Vansittart's engineering career were spent as resident engineer on construction of the Midland Railway of Manitoba, and assistant engineer on the Canadian Pacific Railway irrigation project at Calgary, Alberta. In 1909 he became connected with the firm of Smith, Kerry & Chace, as assistant engineer on construction work of the Crane Falls Power and Irrigation Company at Boise, Idaho. When war broke out he was Vice-President and General Manager of this Company. The certain promise of a successful future did not deter him from immediate enlistment where his military training, ability and experience advanced him until he was gazetted Major and given command of a battery. The efficiency of the unit under him was such as to call for merited praise and prophecies of further promotions and decorations in the future. A Canadian-Staff Officer, writing a personal letter, said of him, "Vansittart is the best battery commander of the outfit, and his gun positions are the pride of the district. Neighbouring artillerymen are sent down to see them as a model of what gun positions should be. The enemy have never located them." He was mentioned in a despatch from General Sir Douglas Haig, published on June 15th, 1916, for honourable and distinguished service in the field. It is with the passing of such men as the late Major Vansittart that the real irreplaceable loss and wastage of the war is impressed most sorely.

WRIGHT, PERCY ANDREW (2nd Lieut.), A.M.Can.Soc.C.E., was born at Brandon, Man., February 19th, 1887, and was educated at Fort Frances public school and Winnipeg Central Collegiate School. In 1907 he entered the services of the Canadian Northern Railway as rodman and chainman on construction of the Pithers Point International bridge across the Rainy River near Fort Frances, and later was instrumentman on location of the Prince Albert-Battleford and Vegreville-Munson branches of the same railway. He was engineer in charge of construction of the Fairford River bridge, Manitoba, in 1912, of the reconstruction of main line bridges, Port Arthur to Winnipeg, in 1913, and of the Pembina River bridge on the Peace River extension in 1914. In the fall of 1914 he took the military engineering course at Winnipeg and left the railway com-

pany to accept the position of City Engineer, Fort Frances. Late in 1915 he joined the First Canadian Pioneers, crossing to England in 1916, where he was transferred to the Royal Flying Corps. In France he did good service, scouting and assisting in raids over the German lines, where he was wounded by anti-aircraft shell fire. On recovering he was engaged as instructor at one of the aviation schools near Birmingham, England, where he was injured in a flying accident on December 20th, 1916, and died the following day. Previous to the accident he had been recommended for the position of flight commander.

BAUSET, MAURICE EDWARD (Lieut.), Junior Can.Soc.C.E., was born at Montreal in 1888. He graduated from the Ecole Polytechnique, Montreal, in 1910, with the degree of B.A.Sc., and also took the degrees of C.E. and M.E. During his college vacations he was an assistant to the Quebec Harbour Commission, and also to the Public Works Department at Gaspè, Que. In the summer of 1910 he was in charge of an exploration party in Gaspè for the Commission of Conservation of Natural Resources. From 1910 to 1913 he was with the Grand Trunk Railway as instrumentman on various surveys. In 1913 he joined the engineering staff of the City of Montreal and remained in that position until he went overseas as a Lieutenant with the 22nd Battalion. He was killed at Courcellette on September 15th, 1916.

MCKNIGHT, AUGUSTUS WILBERFORCE (Lieut.), Junior Can.Soc.C.E., was born at Owen Sound, Ontario, in 1888. He graduated from the Royal Military College, Kingston, in 1909. After graduation he was employed principally on surveying work with the National Transcontinental Railway and at Prince Rupert, B.C. In 1912 he was attached to the city engineer's staff at Berlin, Ont., but shortly afterwards returned to the west. He was resident engineer for Mr. W. M. Davis at Port Moody, B.C., when war broke out. He promptly enlisted and went to the Front with the Divisional Engineers. He was killed in action on August 11th, 1916.

PARR, CLAYTON BOWERS (Major), Junior Can.Soc.C.E., was born at Ottawa in 1889. He graduated from the Royal Military College, Kingston, in 1910. From 1910 to 1912 he was with the Transcontinental Railway as draftsman and instrumentman, when he joined the Canadian Northern Railway as resident engineer on the Ottawa-Pembroke line, remaining in that position until 1914. He was then in the Government service for a short time on stream measurement, etc. In the spring of 1914 he became resident engineer on construction work for the Edmonton, Dunvegan & British

Columbia Railway, but as soon as he heard of the war he resigned his position and coming east received a commission with the 24th Battalion. He was killed in one of the battles on the Somme River during 1916, and at the time of his death was Major in the 24th Battalion.

VERGE, MICHEL LABILLOIS, Junior Can.Soc.C.E., was born at St. Michel, Que., in 1893. He was educated at the Ecole Polytechnique, Montreal, from which institution he received the degree of B.A.Sc. in 1914. He was junior assistant in the city engineer's office, Quebec, during his college vacation periods, and on graduating was appointed as assistant engineer in the Public Works Department of Canada; Quebec district.

He died on April 3rd, 1916.

WEEKS, STEPHEN FREDERICK (2nd Lieut.), Junior Can.Soc.C.E., was born at London, England, in 1887. In 1908 he received the degree of B.Sc. from the Imperial College of Technology (London University). For about a year he was assistant with Alfred Williams & Son, London, engineers to the West Kent Sewerage Board. Coming to Canada early in 1910 he was inspecting engineer with the Canadian Inspection (Duckworth-Boyer Company), Montreal. In the summer of 1911 he became assistant engineer with the Burrard Peninsula Joint Sewerage Board and was in that position when war broke out. He immediately returned to England and enlisted as a private in Kitchener's Army. Later he was given a commission in the Royal Engineers. He was killed in action on July 11th, 1916.

BURROWS, BRUCE HOSMER ACTON (Lieut.), S.Can.Soc.C.E., was born at Winnipeg, Man., in 1893. He graduated from the University of Toronto in 1913, receiving the degree of B.A.Sc. Subsequently he was in the Grand Trunk Railway Shops at Stratford, Ont.; with the Coleman Fare Box Company, Limited, Tottenham, Ont., and with the Canadian-Allis-Chalmers, Limited, Toronto. In 1915 he was appointed a provisional lieutenant with the Canadian Engineers. After taking courses in Ottawa and at the Royal Engineers' College at Brightlingsea, Essex, he obtained a commission. He was killed in action on November 26th, 1916, and at that time was Lieutenant in the 12th Field Company, Canadian Engineers.

DEQUETTEVILLE, STANLEY NELSON (Engr.-Lieut. R.C.N.), S. Can.Soc.C.E., was born at St. Heliers, Jersey, Channel Islands, in 1888. He was educated at Ashford Technical School and for four years was articled pupil at the South Eastern & Chatham Railway at Ashford, Kent. In 1910 he entered the service of the Royal Can-

adian Navy as an Engineer Sub-Lieutenant attached to H.M.C.S. "Niobe." Three years later he was promoted to the rank of Engineer Lieutenant. In January, 1912, he was attached to H.M.S. "Implacable" of the Atlantic fleet, and in May of the same year was transferred to H.M.S. "Indefatigable" of the 1st Cruiser Squadron, being in charge of the dynamos, main engines, boilers, etc., in all the above ships, and having a responsible watch at sea. Mr. deQuetteville was with his ship, H.M.S. "Indefatigable," during the battle of Jutland and was lost with her on May 31st, 1916.

FAIR, ROBERT MCCAMUS (Capt.), S.Can.Soc.C.E., was born at Millbrook, Ont., in 1893. He was educated at Peterborough Collegiate Institute, and on matriculating into McGill University won the Grand Trunk Scholarship. He was a special apprentice in the Motive Power Department of the Grand Trunk Railway and had completed two and a half years of his course at McGill University when he joined the 24th Battalion as a Lieutenant. After being in the trenches for some time he was transferred to the trench mortar battery of his unit, and two months before his death was promoted to the rank of Captain and given command of his battery. He was killed at Courcelette on September 22nd, 1916.

RALEY, WILLIAM EMSLEY (Corporal), S.Can.Soc.C.E., was born at Ottawa in 1893. He was educated at the University of Toronto. In 1910 and 1911 he was rodman with the Alberta Railway and Irrigation Company. In the summer of 1912 he was an assistant with the Department of Natural Resources, Canadian Pacific Railway, and in the summer of 1913 inspector on the construction of the post office at Lethbridge, Alta. He went to the Front as a corporal with the 3rd Canadian Contingent and died of wounds received in action on October 27th, 1916.

ROSS, CHARLES FREDERICK DOUGLAS (Lieut.), S.Can.Soc.C.E., was born at Birkenhead, England, in 1890, and received his scientific training at the Liscard School of Art. From 1906 to 1909 he was an articled pupil to Mr. A. F. Fowler, M.I.C.E., of Liverpool, and for two years afterwards acted as his assistant. In 1911 he came to Canada and was employed by the Canadian Pacific Railway as rodman and transitman at Calgary and Medicine Hat until September, 1914, when the staff was reduced. On the outbreak of the war he joined the Divisional Engineers and went overseas with the 1st Canadian Contingent. He was killed in action in June, 1916.

The President called the attention of the Meeting to the Report of Council, which having been distributed to the membership was taken as read.

Mr. Walter J. Francis moved that the Reports of the Council and House Committee be received; this motion was seconded by Mr. F. W. Tye and carried.

Mr. James White moved, seconded by Mr. F. W. Cowie, that the discussion on the Report of Council be adjourned until this afternoon. Carried.

Mr. R. A. Ross, Vice-President, presented the financial report of and a statement from the Finance Committee in regard to receipts and expenditures during the past ten years.

REPORT OF THE FINANCE COMMITTEE.

Supplementing the annual statement of the auditors, the Finance Committee submits a table showing receipts and expenditures for the last ten years, upon which they have the following comments to make:—

1st.—It will be noticed that the total receipts for 1916 are about \$1,000.00 in excess of the next highest year, namely, 1912.

2nd.—That the expenditure for 1916 corresponds very closely with that for 1912, in spite of the fact that our franking privileges have been cancelled, postage rates increased.

3rd.—One essential difference between those comparable years, 1912 and 1916, is that during the latter year the arrear collections were something over twice those of 1912. On the other hand, the entrance fees in 1912 are very much larger than 1916.

4th.—The moral of the above is that every effort will have to be made to increase the membership, which will assist doubly by increasing current as well as entrance fees.

R. A. ROSS, Chairman of Finance Committee.

RECEIPTS AND EXPENDITURES—CANADIAN SOCIETY OF CIVIL ENGINEERS.

RECEIPTS.

	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
(1) Arrears Collected	\$2,023	\$2,390	\$2,023	\$4,031	\$2,092	\$2,887	\$1,994	\$3,298	\$6,733	\$6,512
(2) Current Fees	6,102	7,089	7,963	9,491	11,893	13,897	15,037	15,616	12,438	13,176
(3) Advance Fees	144	203	376	134	288	158	186	270	139	153
(4) Entrance Fees	1,450	2,010	2,190	2,124	2,779	4,077	4,169	2,895	2,233	2,485
(5) TOTAL	\$9,719	\$11,692	\$12,552	\$15,780	\$17,052	\$21,019	\$21,386	\$22,079	\$21,543	\$22,326
(6) Interest Received	86	99	211	252	187	1,393	894	315	450	429
(7) Miscellaneous Receipts..	623	630	188	79	174	341	225	172	87	972
(8) TOTAL	\$10,428	\$12,421	\$12,951	\$16,111	\$17,413	\$22,753	\$22,505	\$22,566	\$22,080	\$23,727

EXPENDITURES.

(9) Interest Paid .....	.....	.....	.....	.....	.....	\$854	\$1,695	\$1,201	\$1,200	\$1,200
(10) Printing and Stationery..	\$3,608	\$4,055	\$4,902	\$6,268	\$3,757	6,865	6,416	10,551	5,970	6,691
(11) Salaries and Wages	3,485	4,633	4,042	3,845	4,714	5,195	4,906	5,652	4,909	5,180
(12) Taxes and Water	224	226	244	244	247	848	1,466	1,448	1,280	1,300
(13) General Expense	2,192	2,515	2,760	2,670	4,198	4,307	5,257	4,812	4,151	3,260
(14) Branch Societies .....	.....	544	374	648	1,118	2,810	2,121	2,296	2,266	2,454
(15) TOTAL	\$9,509	\$11,973	\$12,322	\$13,675	\$14,034	\$20,879	\$21,861	\$25,960	\$19,776	\$20,085
(16) Excess Receipts	919	448	629	2,436	3,378	1,874	646	.....	2,304	3,642
(17) Excess Expenditures ....	...	...	...	.....	.....	.....	...	3,394	.....	.....

He pointed out that the favourable balance of the year was due to the comparatively large amount for arrears which had been collected, and remarked that it was not likely that so large an amount would be secured from this source during the current year. He moved the adoption of these reports; seconded by Mr. Walter J. Francis. Carried.

REPORTS OF BRANCHES.

The Secretary read the following Report of the Quebec Branch:—

REPORT OF THE QUEBEC BRANCH.

With a view of complying with the Society's request that the reports from the various Branches of the Society be made as short as possible this year, the Quebec Branch would merely state that meetings have been held as usual during the year, that great interest has been taken in the outcome of the Society's efforts to have the principle of the employment of Canadian Engineers by the Canadian Government recognized and adhered to, and also in the results of the progress made by the Committee on Society Affairs appointed at the last meeting.

The newly elected officers are as follows:—

President—A. E. Doucét.

Secretary—W. Lefebvre.

Members of Council—A. R. Decary,

J. E. Gihault,

Althéod Tremblay.

Approved,

A. E. DOUCET, President.

W. LEFEBVRE, Secretary.

On motion by Mr. M. Wolfe, seconded by Mr. E. W. Oliver, this report was adopted.

Mr. J. B. Challies read the following report of the Ottawa Branch:—

REPORT OF THE OTTAWA BRANCH.

This Branch has had one of the most successful years of its history. By the practice of every possible economy consistent with efficiency, by doing without permanent headquarters, by confining our activities within reasonable limits of expenditure, we find our-

selves at the close of our 1916 year, out of debt and with a credit balance of about \$200.00.

Although we are still without permanent quarters we have had no trouble in making suitable arrangements for our evening and luncheon meetings. The Normal School auditorium, the Board room of the Conservation Commission, and the assembly room of the Public Library have always been at our disposal.

While it is considered exceedingly important from the point of view of the profession that our own members should be induced to relate their own engineering experiences and share with their fellow members their practical knowledge of engineering difficulties and in the handling of men, we have felt that during the war it would be more fitting if we confined our papers and discussions to topics of a more popular and general nature which would be of timely and particular interest to the profession.

With many of our members overseas and most of the rest in their various capacities carrying on extra work to assist the Government in the present crisis, we have felt that there would be very little time for evening meetings for serious technical dissertations and discussions. We have, therefore, concentrated our effort on informal gatherings with a view to getting better acquainted with one another, with the affairs of the Society, and with problems of general interest to the engineering profession.

We have been exceedingly successful. Ottawa engineers know one another to-day as they never did before. There has been a marked increase of interest in Society affairs, not only among members of the Branch, but among non-members, and very important, as a result of our activities during the year, there has been a very notable development of esprit de corps, and it is felt that the prestige of the engineering profession has been enhanced. One of the most potent influences in this connection has been our luncheon meetings, particularly the occasion of the address by the Right Honourable Sir Wilfrid Laurier on, "The Engineer in Canada."

One of the greatest influences for developing general interest in Society affairs has been the efforts of the Ottawa members of the special committee on Society affairs, who have, by their carefully conscientious efforts to obtain the thought of the members of the Branch respecting Society matters, undoubtedly developed an intelligent active interest in our Society, which has not existed in the past, at any rate, among the rank and file of the Branch.

The Branch arranged for a special qualifying course for officers in the engineers, which was held during the months of February,

March, April and May. The classes, which required a part of two afternoons and two evenings a week, were particularly well attended. While they were under way, the Managing Committee felt that it would not be wise to arrange for other meetings. During this period, however, the Branch, at the request of the Sportsmen's Patriotic Association of Ottawa, arranged for a Sunday evening patriotic concert in the Dominion Theatre, which proved to be a very great success.

In the last annual report reference was made to two amendments to the Branch by-laws, which have subsequently been formally approved by letter ballot and put into force. The first provided for the enlargement of the Managing Committee to include the past chairman and past secretary, for one year following their term of office, and the sitting members of Council within the jurisdiction of the Branch during their term of office. The change has provided for easy and direct communication between the executives of the main Society at Montreal and of the Branch. It has furnished continuity of direction of Branch affairs between successive Managing Committees, furthermore, it has made available to the Branch, the benefit of the considered judgment of members best qualified to advise and assist.

The second amendment provided that the fiscal year of the Branch should be the same as that of the main Society. From its organization in 1909 our Branch year has remained from October to October. The change enables us to report to the main Society for the same period for which the main Society affairs are reported at the annual meeting.

Papers.—The Papers and Entertainment Committee have been very successful in obtaining a number of prominent speakers on subjects of great interest to the engineering profession as well as to the general public. The attendance at our open meetings has been unusually large. The following is a list of the meetings held during the past fifteen months:—

EVENING MEETINGS.

Nov. 17, 1915.	John Murphy, M.Can.Soc. C.E.....	"A Trip to the Panama-Pacific Exposition."
Dec. 16, 1915.	J. A. D. McCurdy, B.A.Sc., Managing Director of Curtis Aeroplanes & Motors Limited	"Aviation."

- Dec. 16, 1915. S. Fortin, M.Can.Soc.
C.E., Structural Engineer,
Public Works Dept..... "Novel Systems of
Foundations Used in
Connection with Fed-
eral Legislative Pal-
ace, Mexico City."
- Jan. 17, 1916. Organization of Military
Engineering Classes ...
- Jan. 21, 1916. G. R. G. Conway, M.Can.
Soc.C.E., Consulting En-
gineer, Toronto "The Engineer and
Standards of Beauty."

LUNCHEONS.

- Nov. 29, 1915. Brig.-Gen. Sir Alex.
Bertram, M.Can.Soc.C.E.,
Chairman of Shell Com-
mittee "Munitions."
- Jan. 13, 1916. Dr. Adam Shortt, Civil
Service Commissioner... "The War and the
Engineer."
- Mar. 17, 1916. E. A. Dunlop, M.L.A.,
Pembroke "A Trip to the Battle
Front."
- Apr. 13, 1916. Lt.-Col. Melville, O.C.
Engineer's Training De-
pot, Ottawa "With an Engineer Bat-
talion at the Front."
- Oct. 19, 1916. Prof. B. Bakhmeteff,
Imperial Russian Supply
Commission in America. "The Russian Engineer
and the War."
- Nov. 23, 1916. Sir Wilfrid Laurier..... "The Engineer in Can-
ada."

Membership.—A special effort has been made by our Member-
ship Committee to induce worthy members of the profession to
enter the Society. Excellent results have been realized, fourteen
new members being added.

The Branch membership figures for 1914, 1915 and 1916 are given hereunder:—

	1914.	1915.	1916.
Honorary Members	3	1	1
Members	46	51	60
Associate Members	113	124	124
Associates	1	1	1
Juniors	28	33	36
Students	16	27	28
Ottawa Associates	21	17	23
	<hr/> 228	<hr/> 254	<hr/> 273

Upwards of fifty of our members are now on active service.

Library.—The library and records of the Branch have been placed in one of the most convenient office buildings of the city and a librarian appointed. During the past year many important additions have been made to the library. Special efforts are now under way for indexing and classifying the lantern slides in the possession of the members, and those which are in the possession of Government offices, but under the direction of members. Efforts are also being made to secure photographs or records of historical interest to the engineering profession.

The annual meeting of the Branch was held on the 11th of January in the Board Room of the Conservation Commission, when the following officers were elected:—Chairman, Mr. Alex. Gray; Secretary-Treasurer, Mr. J. B. Challies; Managing Committee:—Messrs. Gordon Gale, A. T. Phillips, W. F. M. Bryce, S. J. Fortin, J. H. McLaren.

JOHN MURPHY, Chairman.

J. B. CHALLIES, Secretary-Treasurer.

On motion by Mr. J. B. Challies, seconded by Mr. W. F. Tye, this report was adopted.

The Secretary read the following Report of the Manitoba Branch:—

REPORT OF THE MANITOBA BRANCH.

The Manitoba Branch begs to submit the following report for the year 1916:—

The present membership of the Branch is as follows:—

Members	37
Associate Members	83
Juniors	21
Students	29
Local Associates	54
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Total	224

Eight meetings of the General Section were held during the year at which the average attendance was thirty-two.

Eight meetings of the Electrical Section were held with an average attendance of thirty-two.

Three meetings of the Mechanical Section were held with an average attendance of forty-five.

The Annual Meeting of the Branch was held on December 7th, 1916, and the following officers were elected for the season 1917-18:—

Chairman—W. L. MacKenzie.

Executive Committee—J. C. Holden,
H. W. McLeod,
M. V. Sauer.

Auditors—B. S. McKenzie,
T. L. Roberts.

Secretary-Treasurer—A. W. Smith.

The Treasurer's Report presented at the Annual Meeting of the Branch showed a credit balance of \$440.17.

Respectfully submitted,

FRANK LEE, Chairman.
A. W. SMITH, Secretary-Treasurer.

On motion by Mr. J. G. Legrand, seconded by Mr. R. F. Uniacke, this report was adopted.

The Secretary read the following report of the Edmonton Branch:—

REPORT OF THE EDMONTON BRANCH.

The Branch now comprises forty-five members, classified as follows:—

Members	7
Associates	1
Associate Members	29
Juniors	6
Students	2
Total	45

Nine members are absent on active military service and others on other war service, consequently, the average attendance is below that of last year.

The meetings are of an informal nature and are held monthly on the third Wednesday. Usually a paper is read followed by a discussion; and following that the business matters are disposed of.

In February we had the privilege of entertaining Mr. F. C. Gamble, Past-President, Canadian Society of Civil Engineers, at a banquet in the Macdonald Hotel.

The question of the employment of alien engineers on Government work was taken up along the lines suggested by headquarters.

A provincial division was formally constituted by Council, and negotiations in connection with the formation of this division are now being carried on with the Calgary Branch.

The election of Branch officers is held in May, those elected take office the following October and remain in office one year. The fiscal year closes in October. The election of officers for the season 1916-17 was as follows:—

Chairman—Mr. L. B. Elliot.

Vice-Chairman—Mr. J. Chalmers.

Secretary-Treasurer—Mr. C. A. Robb.

Members of Executive—A. T. Fraser,

J. L. Côté,

D. J. Carter,

D. Donaldson.

Messrs. J. Chalmers and C. A. Robb resigned to take up duties with the Imperial Munitions Board, and Mr. J. D. Robertson was elected as vice-chairman, and Mr. A. W. Haddow as secretary-treasurer to fill the vacancies.

The following is a schedule of the meetings held during 1916:—

January 19th.—City Engineer's office. W. R. Smith, M. Can. Soc. C. E., (Chief Engineer, E. D. & B. C., and A. & G. W. Rys.).
 "The individual responsibility of members of the profession."

February 9th.—Special, Macdonald Hotel. Banquet in honour of Mr. F. C. Gamble, retiring President, Can.Soc.C.E. General discussion of Society affairs.

February 16th.—University of Alberta. N. M. Thornton, M.Can.Soc.C.E., (Consulting Mining Engineer). "The development of the Mountain Park coal fields." (Illustrated.)

March 24th.—First Presbyterian Church. Prof. Jno. A. Allan, (Geology, University of Alberta.) "The Panama Pacific Exposition." (Illustrated.)

May 10th.—Cecil Hotel. Informal dinner and election of officers.

November 3rd.—Selkirk Hotel. Informal dinner and annual meeting for receiving financial report.

November 15th.—Prof. Jno. A. Allan, (Geology, University of Alberta.) "Geological problems of the petroleum resources of Alberta."

December 20th.—N. M. Thornton, M.Can.Soc.C.E., (Consulting Mining Engineer.) "Past and present methods of coal mining."

Respectfully submitted,

L. B. ELLIOT, Chairman.

A. W. HADDOW, Secretary-Treasurer.

On motion by Mr. J. G. Legrand, seconded by Mr. J. R. W. Ambrose, this report was adopted.

The Secretary read the following report of the Regina Branch:—

REPORT OF THE REGINA BRANCH.

Our Annual Meeting was held on December 4th, at which the following were elected:—

Chairman—L. A. Thornton.

Vice-Chairman—W. R. Harris.

Secretary-Treasurer—J. N. deStein.

Members of Executive—E. G. W. Montgomery,
R. J. Lecky.

Past-Chairman—(ex-office member)—O. W. Smith.

Auditors—D. A. R. McConnell,
H. R. MacKenzie.

The arrangement entered into with the Regina Engineering Society to hold alternate meetings every first Thursday was satisfactorily maintained. Ten joint meetings were held, five of which were presided over by the Regina Branch, Canadian Society of Civil Engineers. There were also a number of Executive and Business meetings held by the Branch itself.

Amongst the papers read we mention:—

“Reminiscences of an Old Surveyor,” by Cyrus Carrol,
M.Can.Soc.C.E.

“Terminal Elevator Construction,” by C. D. Howe, M.A.S.C.E.

“From Conception to Completion—The Western Railroad,”
(Part I.), by J. N. deStein, M.Can.Soc.C.E.

Our membership comprises,—

Members	7
Associate Members	19
Juniors	2
Students	2
<hr/>	
Total	30

A total of 30, being an increase of five over the previous year. Of this number eleven are on active service, having joined the Overseas Forces.

During the year sixty dollars have been received in rebates from the Parent Society and a balance of twenty-six dollars was reported on hand by the Treasurer.

A detailed list of members giving their addresses, etc., has been submitted to the Secretary a short time ago.

From attached statement you will notice that the Regina Branch—supported by all members of our Society in this Province—proposes to extend its scope and form the “Saskatchewan Branch of the Canadian Society of Civil Engineers.”

We hope at the next Annual Meeting to be able to forward a very satisfactory statement of this new subdivision of our Society.

Respectfully submitted,

L. A. THORNTON, Chairman.

J. N. DESTEIN, Secretary-Treasurer.

On motion by Mr. G. Stead, seconded by Mr. J. G. Legrand, this report was adopted.

The Secretary read the following report of the Calgary Branch:—

REPORT OF THE CALGARY BRANCH.

On behalf of the Calgary Branch of the Canadian Society of Civil Engineers we beg to submit the following report for the year 1916:—

During the past year there have been four general business meetings of the Branch, including the Annual Meeting in December.

The Executive Committee held ten business meetings, and the Committee on Credentials and Applications held two meetings.

Four dinners were given during the winter.

During the winter the Branch was entertained by the following speakers:—

DATE.	NAME OF SPEAKER.	SUBJECT.
Jan. 13, 1916.	Comm. A. G. Graves....	"The Administration of Public Utilities."
Feb. 3, 1916.	C. D. Howe, Esq., Chief Engineer, Dominion Government Grain Commission	"Government Elevator Construction." Illustrated with lantern slides.
Feb. 24, 1916.	Dr. J. G. Rutherford....	"Some Thoughts on the Present World Situation." Ladies' Night.
Mar. 16, 1916.	G. N. Houston, M.Can. Soc.C.E.	"Legislative Control of Engineering Practice."
Mar. 28, 1916.	H. B. Muckleston, M. Can.Soc.C.E.	"The Electrical Illumination of the Panama-Pacific Exposition," Illustrated with lantern slides.

The last-named lecture was given in Paget Hall under the auspices of the Tan-nis-uk Chapter, I.O.D.E. An admission of 25 cents was charged and the net proceeds amounting to \$101.85 devoted to their Red Cross Work.

A statement of the finances of the Branch on November 30th, 1916, shows a balance of \$326.88 in the Bank.

Nineteen members of the Branch have enlisted for active service of whom we regret to record the deaths of Messrs. J. H. Rosher (S.), and C. D. Ross (S.). Mr. E. B. McLean (S.), has been reported missing since November last.

The Annual Meeting was held December 2nd, 1916, and the following officers were elected for the ensuing year:—

Chairman—A. S. Dawson.

Secretary-Treasurer—Sam. G. Porter.

Executive Committee—H. Sidenius,

M. H. Marshall,

C. M. Arnold,

F. H. Peters, Past-Chairman, ex-officio.

William Pearce, Past-Chairman, ex-officio.

Auditors—J. S. Tempest,

S. K. Pearce.

The present membership of the Branch is fifty-nine, made up as follows:—

Members	13
Associate Members	30
Juniors	5
Students	1
Associates	10
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Total	59

Respectfully submitted,

A. S. DAWSON, Chairman.

SAM. G. PORTER, Secretary-Treasurer.

On motion by Mr. G. Stead, seconded by Mr. H. V. Brayley, the report was adopted.

The Secretary read the following report of the Vancouver Branch:—

REPORT OF THE VANCOUVER BRANCH.

During the year 1916 the following papers were read:—

- Jan. 6. "Some Remarks on Railway Location Problems in British Columbia." By C. E. Cartwright, M. Can. Soc. C.E.

- Jan. 27. "The Vancouver Grain Elevator." By Mr. C. D. Howe, Dominion Government Engineer.
- Feb. 11. "The City of Kamloops Power Plant and Pumping Station." By H. K. Dutcher, M.Can.Soc.C.E.
- Mar. 2. "The Prince Rupert Dock of the G.T.P. Railway." By Mr. Pillsbury, G.T. Engineering Staff.
- Mar. 23. "The Bridges on the C.N.P. Railway." By J. L. Harrington, M.Can.Soc.C.E.
- Apr. 13. "Pneumatic Foundations." By E. G. Matheson, M.Can.Soc.C.E.

On September 25th a deputation from the Branch interviewed Sir George Foster asking, for the Society, the support and recognition of the Dominion Government and expressing the hope that one day the Dominion Government would recognize and consult with the Society on national engineering questions in the same way that the Governments of Great Britain and the United States recognized and consulted with the Institution of Civil Engineers and the American Society of Civil Engineers.

Arrangements have been made with the University Club, Vancouver, whereby the members of the Society have the use of the Club Reading Room.

No papers have been arranged for this Session as so many members are overseas.

Yours faithfully,

A. D. CREER, Secretary-Treasurer.

On motion by Mr. H. M. MacKay, seconded by Mr. G. A. McCarthy, the report was adopted.

The Secretary read the following report of the Victoria Branch:—

REPORT OF THE VICTORIA BRANCH.

The following officers were elected for 1917 at the Annual Meeting of the Branch held on December 13th in the clubroom.

EXECUTIVE.

Chairman—D. O. Lewis.

Vice-Chairman—R. A. Bainbridge.

Treasurer—E. Davis.

Secretary—R. W. Macintyre.
E. G. Marriott.
C. Hoard.

Past-Chairmen—(ex-officio)—F. C. Gamble and H. W. E. Canavan.

Auditors—Lewis W. Toms and J. B. Shaw.

Nine meetings were held during the year with an average attendance of twelve.

The following six papers were read and discussed:—

1.—Rules and regulations of British Columbia relating to annual rental of Water Powers, by E. Davis, M.Can.Soc.C.E.

2.—Architecture of Bridges, by C. E. Fowler, M.Can.Soc.C.E.

3.—The Mexican Light and Power Company's Development, by R. F. Hayward, M.Can.Soc.C.E.

4.—Domestic Water Supply of Greater Vancouver, by W. Young, M.Can.Soc.C.E., and W. C. Smith, A.M.Can.Soc.C.E.

5.—Marine Wood Borers, by D. O. Lewis, M.Can.Soc.C.E.

6.—The Construction of New Dominion Observatory and Telescope on Little Saanich Mountain, Victoria, by Dr. Plaskett.

Three applicants were elected Branch Associates, of whom two are now Corporate Members of the Society.

Three Corporate Members and three Branch Associates have joined the overseas forces during the past year, bringing our known total up to 25 in the C.E.F., and of this number, two Corporate Members, Lt. A. E. Evans and Capt. A. W. Agnew, have been killed in action during 1916.

The membership of the Branch stands as follows:—

Members	24
Associate Members	33
Juniors	8
Students	1
Branch Associates	9
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Total	75

showing a decrease of four with last year's total.

Respectfully submitted,

D. O. LEWIS, Chairman.

R. W. MACINTYRE, Secretary.

On motion by Mr. H. V. Brayley, seconded by Mr. H. E. T. Haultain, the report was adopted.

The Secretary read the report of the Toronto Branch.

REPORT OF THE TORONTO BRANCH.

The Toronto Branch had a fairly successful year in spite of the very unusual conditions caused by the war, approximately one-third of our total membership having enlisted for service overseas. During the year we added about 25 new members. We now have on our lists:—

Members	50
Associate Members	120
Juniors	30
Associates	6
Students	84
<hr/>	
Total	290

We held nine evening meetings and one afternoon excursion to a work of engineering interest.

One of the evening meetings took the form of a smoker, and in others we endeavoured to depart from the purely technical, and had subjects for discussion of more popular interest; the average attendance being forty-two.

At the beginning of the year Committees were formed to work upon specifications and subjects looking to the advancement of the profession.

We have already forwarded to Council the report of our Committee on General Clauses for Specifications, upon which a great deal of careful work was done. At the present time we have no other reports available for presentation at this meeting.

The financial statement for the year ending December 31st, 1916, shows a balance on hand of \$187.20.

Our receipts for the year were \$342.63, and our expenditures \$380.25.

At our regular meeting held on January 11th, the following officers were elected for 1917:—

Chairman—E. W. Oliver.

Secretary-Treasurer—L. M. Arkley.

Executive—H. G. Acres,

A. H. Harkness,

E. G. Hewson,

T. T. Black.

The retiring Chairman, G. A. McCarthy, also acts as a member of the Executive.

E. W. OLIVER, Chairman.

L. M. ARKLEY, Secretary-Treasurer.

On motion by Mr. H. E. T. Haultain, seconded by Mr. E. W. Oliver, the report was adopted.

The following reports from Divisions were received after the close of the Meeting and ordered to be incorporated in the Report of the Annual Meeting:—

BRITISH COLUMBIA DIVISION.

To the President and Council,
of the Canadian Society of Civil Engineers,
Montreal.

Gentlemen:—

I have the honour to report briefly on the affairs of the British Columbia Division for the past year.

The organization of the Division was completely effected in December, 1915, and the Committee elected for the ensuing year. Upon a consideration of the existing conditions as affecting the interests of the Society in the Province it was felt by the Committee that inasmuch as a great number of the members had left the Province on Active Service, and the interests of the Society were being adequately represented by the Branches, there was little occasion for action on the part of the Division.

It was considered that the organization should be properly maintained with a view to more active efforts on the return of our Members.

Yours very truly,

E. A. CLEVELAND, Secretary-Treasurer

MINUTES OF A MEETING OF A JOINT COMMITTEE FOR THE
ORGANIZATION OF A DIVISION FOR THE PROVINCE OF ALBERTA.

A Joint Committee for the formation of a Provincial Division for the Province of Alberta met at the Palliser Hotel on the 18th

instant. The Committee consisted of A. T. Fraser and D. J. Carter representing the Edmonton Branch, and F. H. Peters and S. G. Porter representing the Calgary Branch. The various steps necessary for completing the formation of the Provincial Division were discussed.

It was agreed that in accordance with Section 56 of the By-laws of the Parent Society that the Edmonton Branch should have two representatives on the Committee, the Calgary Branch two representatives, and the outside members two representatives. J. T. Child, of Banff, and J. G. McGregor, of Red Deer, were suggested as members of Committee representing outside membership, pending a regular election. In addition to the representatives above named, any Member of the Council residing in the Province will be Ex-Officio Member and Chairman of the Committee.

It was agreed that in order to facilitate the work of the Division the Secretary-Treasurer should be located at the same point as the Chairman, and that this policy should be adopted by the organization.

Mr. Peters suggested that in view of the necessity of some money for expenses that each of the two Branches in the Province contribute \$25.00 as a fund. Mr. Fraser thought that if Calgary would contribute \$30.00 and Edmonton \$20.000 it would be nearer in proportion of the strength of the two Branches.

S. G. Porter, Secretary of the Calgary Branch, and A. W. Haddow, Secretary of the Edmonton Branch, were appointed to draft by-laws to be submitted to the members for adoption.

The present Committee, with S. G. Porter as Secretary, is to continue until a permanent organization is effected.

SAM. G. PORTER, Secretary.

REPORTS OF COMMITTEES.

Conservation.—Mr. James White presented the following report of the Committee on Conservation.

REPORT OF COMMITTEE ON CONSERVATION.

MEMBERS OF COMMITTEE.

G. A. Bayne,	H. F. Laurence,
W. H. Breithaupt,	R. S. Lea,
E. E. Brydone-Jack,	R. W. Leonard,
H. J. Cambie,	R. McColl,
J. B. Challies,	Wm. McNab,
John Chalmers,	A. J. McPherson,
C. R. Coutlee,	C. H. Mitchell,
J. S. Dennis,	W. R. W. Parsons,
C. E. W. Dodwell,	E. T. P. Shewen,
A. E. Doucet	R. O. Sweezey,
J. B. Hegan,	T. H. Tracy,

James White, Chairman.

GENERAL REVIEW OF CONSERVATION WORK IN CANADA DURING 1916.

The advance of conservation, of general industrial improvement, in Canada has been impelled and facilitated during the past year by the most powerful stimulus. Progress toward the better utilization of the resources of the Dominion has naturally attained greater momentum in the form of a national necessity than it could be expected to achieve as an inadequately realized desirability, awaiting the creation and support of effective public sentiment. The events of 1916, and especially of the past few weeks, have served to emphasize more forcibly than ever the relation of economic efficiency to national strength and safety.

Among the concrete achievements of the past year, the conclusion of a treaty whereby Canada and the United States will co-operate in the protection of migratory bird life should prove of inestimable service to agricultural and forest production, the two chief branches of Canadian primary industry. The material importance of this measure and the utility of the insectivorous bird life, which it is designed to protect, may be judged from the statement, based on reliable authority, that the annual loss in the United States from the depredations of insects amounts to \$800,000,000. This international

action to preserve the insectivorous and game bird resources of North America as a permanent asset stands as a pre-eminent feature of conservation progress during 1916.

As a result of recent action the future economic development of the Dominion will benefit by the aid and guidance of systematic, industrial research. The appointment of the Industrial Research Commission by the Dominion Government and the corporate enterprise of the Canadian Pacific Railway in promoting scientific research will enable Canadian industry to utilize the services of two highly organized institutions. In the same manner as the forest industries are now in receipt of the services of the Forest Products Laboratories at Montreal, every form of industry should be enabled to avail itself of expert assistance in the solution of its peculiar problems. To achieve the maximum results industrial research must be linked up with a thorough system of technical education.

Town planning progress merits special mention as a conservation movement. Aside from its bearing on public health, town planning seeks the economical use of public funds. During the opening decade of the century, Canada invested approximately \$600,000,000 on municipal growth, largely for civic improvements. Heavy additional expenditures have been made since 1910. The efficient investment of capital on such a large scale cannot be secured as long as municipal development continues in haphazard manner. Adequate legislation and administrative machinery must be provided to control and guide urban expansion. During the past year distinct progress has been made in this direction and it is hoped that every Province in the Dominion will shortly possess proper provision for thorough control of housing and town planning.

In practically every branch of primary production and natural resources, the war has created special conditions and conservation problems. In many instances, the national waste due to failure to utilize our opportunities to the full extent has been greatly reduced. This applies particularly to water powers, the development of which is proceeding rapidly. Similarly, with regard to mining, renewed activity in both basic and subsidiary undertakings has taken place and thorough study of the status of our mineral industries has been undertaken. The fishing industry has been stimulated by the unprecedented demand for Canadian fish to relieve the shortage in the United Kingdom. Experiments have been undertaken to ascertain the possibility of securing profitable utilization of the immense amounts of fish offal which have hitherto been entirely wasted. It is hoped to furnish the fishermen with practical methods of converting this material into valuable products.

As regards agriculture, the Federal and Provincial Governments, as well as railway and other agencies, are taking steps to promote

after war settlement on an extensive scale and in an improved manner. With the proper guidance of colonization, with adequate provision for marketing facilities, rural credits and social intercourse, a rapid increase of productive areas should be attained.

It is gratifying to record the decision of the Ontario Government to remodel its forest protective service along the most approved lines. The remarkable development of our pulp industry indicates the potential value of our forests and the wisdom of affording the most efficient protection obtainable. The work of determining the extent of our timber resources progresses steadily, surveys of British Columbia and Saskatchewan forests have been completed during the past year.

Mr. James White stated that Colonel Léonard had communicated a memorandum as to Mr. Lionel Curtis's views on immigration problems following the war, which he summarized.

Mr. W. H. Breithaupt had communicated a discussion on City Planning, referring particularly to progress made in some Ontario towns.

Mr. James White moved the reception of this report, seconded by Mr. G. A. McCarthy. Carried.

In discussion of this report, Mr. M. J. Butler asked what the Government was really doing regarding the many problems which would face us after the war. Mr. White in reply mentioned the formation of a Research Committee of which Messrs. R. A. Ross and A. Surveyer were members. Mr. Ross briefly explained the work upon which the Honorary Advisory Council for Scientific and Industrial Research was entering and intimated that the Society would be called upon for help along certain definite lines.

After further discussion Mr. W. McNab moved, seconded by Mr. J. A. Burnett, that the report be adopted and the Committee continued with Mr. James White as Chairman, but that the membership of the Committee should be reduced. Carried.

AFTERNOON SESSION, TUESDAY, JANUARY 23RD, 1917.

Address of the Retiring President.

Mr. R. A. Ross, Vice-President, occupied the chair during the reading of the following address by Mr. G. H. Duggan, the retiring President:—

Custom has unfortunately decreed that the retiring President shall make an address, and there seems no escape from this ordeal either for my audience or for me; but in these strenuous times, few are entire masters of their actions, and I have the excuse for

brevity that time has not permitted the preparation of an address fitting to such an occasion. I shall, however, take the opportunity to place on record a few statistics I had looked up for my own information, and to say a few words about our Society—a subject that is very dear to me.

The Society was established February 24th, 1887, and incorporated 23rd June, 1887. The 30th Anniversary of our foundation thus occurring this year, it may not be inappropriate to record some statistics of our growth and history so that they shall be in convenient form for reference and in the hope that this history may be of assistance in shaping our course for the future.

There is on file with the Secretary, a table showing for each year since the formation of the Society, the number of members in each grade, the total corporate membership and the total membership of all classes. Also, showing the number of members exclusive of students in each Province with the percentage these numbers bear to the total membership, exclusive of students, of the Society for that year.

The table is somewhat cumbersome to print and the following charts have been prepared from it:—

Chart No. 1 shows the membership each year in different classes.

Chart No. 2 shows the distribution by Provinces of the members, not including students, for each year.

Chart No. 3 shows the percentage of corporate members in each Province for each year.

Table No. 4 shows the date of formation of each Branch and its membership each year thereafter to the present time; also the dates of formation of the Provincial Divisions now existing with their present membership.

Table No. 5 gives a few dates of the more important events in our history, such as the creation of new grades of membership, changes in dues, changes in by-laws and adoption of important additions thereto, etc.

The growth of the Society and the distribution of its members is apparent from the charts and tables without comment, but it seemed to me interesting to record the increase in membership in the larger Eastern cities, and by somewhat broader geographical divisions. I have, therefore, shown on table No. 6 the first year 1887, the past year 1916, and the intermediate year of 1902, the total corporate membership, in column "A"; the corporate membership resident in Toronto, column "B"; in Ottawa, column "C"; in Montreal, column "D"; in the area bounded by lines roughly

drawn around these three cities, "E," and in the somewhat arbitrary geographical divisions of west of Port Arthur, "F"; from Port Arthur to Montreal, "G"; east of Montreal, "H," with the percentage of the total corporate membership in each column for each year.

It will be seen that in 1887 the city of Montreal had 30.4% of the membership; the area shown in column "E," 65%; the district Port Arthur to Montreal, column "G," 80.5%, and the district west of Port Arthur, column "F," only 7.4%. In 1902 Montreal had dropped to 29.5%; the district, column "E," to 55.4%; the district Port Arthur to Montreal to 34.7%, while the district west of Port Arthur had increased to 13.7%.

Comparing 1887 with 1916,—Montreal has decreased from 30.4% to 17.4%; the district, column "E," from 65% to 36.7%, and the district Port Arthur to Montreal from 80.5% to 65.5%. The district east of Montreal has remained practically stationary, being 12.8% in 1887 and 11.9% in 1916, but the district west of Port Arthur has increased from 7.4% to 23.4%.

In passing I may say that my geographical districts were chosen before the report of the Committee was made or they would have been made to agree therewith.

It will thus be seen that Montreal on the count of members alone would naturally have been chosen originally as the headquarters of the Society, but there were additional considerations in that Montreal was also the headquarters of a number of large corporations employing engineers, and that it was conveniently reached by the majority of the membership at that time. Although Montreal's percentage of membership of the whole Society has dropped from 30.4% to 17.4%, it still easily maintains its lead in actual numbers over any other city, having 367 corporate members against 168 in Ottawa, which has the next largest number; it remains the head office of the large railway companies and of large engineering corporations, and it is only a few hours' run from any where in district "E," still containing 36.7% of the membership; more convenient than any other large city to the eastern district containing 11.9% of the membership, and convenient to the district from Port Arthur to Montreal containing 65% of the membership. So that it may be said to have 77% of the membership tributary to it and, to all appearances it will continue to be the headquarters of the Society for a long time to come.

While there has been a large increase in the number of members in the district tributary to Montreal, there has been a much larger percentage of increase in the number of members west of

Port Arthur so situated that they can only reach Montreal at much expense and with considerable loss of time; and I think one would be pretty safe in saying that many Canadian engineers have never even seen this building or know anything of the work of the Society beyond its publications and the activities of the local Branch to which they belong. It is to be expected that members so situated should feel they are best served as regards their daily work by their local associations and have little interest or sympathy in the general work of the parent Society as it exists to-day. My personal impression is that this attitude has increased largely of late, its tendency under our present organization is to still further increase, and that, if we are to build up a strong national Society representing the whole profession in Canada, it is a factor to which most earnest consideration should be given.

Branches.—The charter members, although so compactly situated, apparently foresaw the spread of our membership and made provision in By-law No. 31, now No. 54, for the formation of Branches. The idea grew, it was discussed and encouraged in my early days on the Council, and I was interested in the first Branch formed at Sydney, N.S., when resident there in 1905, but, unhappily, that Branch did not survive the stress of heavy and rapid construction work in which all of its members were engaged. It will be seen that in 1906 there were only two Branches, one of which is not now in existence, with a total membership of 74, or 5.3% of the whole; while in 1915, the last year for which we have complete records, there were ten Branches with a total membership of 948, or 31% of the whole membership.

Table No. 5 shows that the Society and the Council have not been inactive in providing headquarters worthy of the Society as it grew, in revising our by-laws, in altering the grades of membership as occasion arose, in providing for examination of candidates and generally in elevating the requirements for membership so that membership in the different grades might have a more definite meaning to the profession.

In this connection it is interesting to note that in 1887 the Members were 53% of the total membership; in 1897, 47.5%; in 1907, 26.7%, and 1916, 22.6%. Associate Members in 1887 were 15.4%; in 1897, 25%; 1907, 37%; in 1916, 52.5%; or, classing Juniors with Associate Members, 57.8%. Summarizing: the percentage of Members has dropped from 53% to 22.6%, while the percentage of Associate Members has risen from 15.4% to 52.5%.

In addition to the above, codes of ethics have been adopted and other internal changes made as required to keep abreast of

our growth and the times. Legislation has been sought and obtained in some cases, whether that legislation has always been wise or not, it was nevertheless the desire of the majority of the members at the time and, in either view, it now has little effect on the general activities of the members, and may be left out of the discussion.

That ends my formal address. My further remarks are largely my personal opinions on the future conduct of our Society, are thus controversial and do not properly belong to a Presidential address—indeed, it would perhaps be wiser to stop here on safe ground; but, in view of the interest now aroused in quickening our activities and enlarging our scope, the attention these matters are likely to receive at this meeting and the inability of the Chair to take part in the discussion, I cannot let the opportunity go without making some comments and suggestions. I trust I may be understood, I ask your further attention to my informal remarks to follow, only because of my deep interest in the welfare of the Society and the profession. I have had an active part in the management of its affairs for a long time, having served on the Council for fifteen years, starting in 1894, and have knowledge of many of the complaints, suggestions and acts of the Society during that period. In reference to one frequent complaint,—I wish to say that I have not served on any Council in that time of which the members who could attend have not been regular in attendance and have not given their best thought to every question that arose touching the welfare of the Society or the consideration of the applications for membership in whatever grade.

The statistics, showing as they do a very healthy growth in membership and apparently a wide-spread interest, if taken by themselves would seem to be cause for complacency and a feeling that all is well. We know, however, from the many complaints, that most of our members are far from satisfied, and I feel myself that we have only made a start towards organizing our forces to advance our profession to that position in public estimation to which the engineer is entitled.

We may first inquire of what benefit the Society can be to its members, and what it is now accomplishing. It seems to me the benefits to be expected are of two kinds. First, what might be called the internal benefits within the profession, such as, the professional standing amongst ourselves, conferred by membership; the advancement of professional knowledge by the reading and discussion of papers and the work of technical committees; the acquaintances and friendships brought about by meetings, con-

ventions and other Society activities; and some advantages to its members in finding employment and advancement resulting from the above.

The other class of benefits we might call external, broadly covered by the proper recognition of the profession of the engineer by the public, including the proper appreciation of the engineers' services on engineering questions and the further recognition by the public that the engineer by his training and attainments should be eminently fitted to take his place in public affairs, and that he should be sought as an adviser in questions not only of engineering, but as well on other important matters where his engineering training and standing qualify him to give sound advice on affairs not directly related to the practice of his profession. The latter feature, under many different headings and in different ways, has been the subject of a number of addresses and discussions amongst our neighbors in the United States and the technical press has made several references to the success attending this movement.

In my view we should strive for all these benefits, both internal and external, but we cannot hope to attain full success in our quest for external benefits until we have put our house thoroughly in order and so organized our institution that we realize the internal benefits to the greatest extent possible, and I wish, therefore, to make a few suggestions as to improvements that seem within our immediate grasp.

It seems to me important to have some arrangement by which the considerable portion of our membership far removed from headquarters can keep in touch with the work of the Society and can take its share of directing that work. It is true that every member now receives a report of proceedings at the annual meetings, such transactions as our limited funds enable us to print, and most of the members belong to some local Branch or Division where matters of more or less general interest come up for discussion and which sends in a report once a year to be distributed to all of the members of the Society. This, however, is long range work, in many cases divested by elapsed time of its interest, and there must be many who would be glad to take an active interest and discuss our affairs from time to time as they arose as does the central Council, but who do not care to give the time to put their views in correspondence—indeed, there is little opportunity for any one to do so.

The Bulletin recommended in the report of the Committee will no doubt do much to interest the members far removed from headquarters in the general affairs of the Society, but it cannot well supply the interest aroused by an active participation in the direc-

tion of affairs, and I think some plan should be devised by which there should be a special meeting of the Council at least once a year, preferably twice, to discuss the more important affairs of the Society. If it is not feasible to bring the whole Council together, delegates could be sent from the Provincial Divisions where these exist, and arrangements could be made to nominate a Councillor to represent a district where a division has not yet been formed. It seems to me that in an organization such as ours, meeting in general convention only once a year and properly limited in its actions as to changes in by-laws and the general conduct of affairs so that these can only be brought about by slow and elaborate process, it is necessary to leave much to the direction of the Council. For, while the discussions that take place at these annual meetings are most valuable, little action can result from them except as it is worked up in detail by the Council, and I think important affairs should be discussed and determined by more of the Council than can possibly attend the ordinary meetings. Many of our Councillors resident in Ottawa, Quebec and Toronto sometimes attend the regular meetings, but it must be a tax to come even this distance, and it cannot be expected that Councillors will come from a greater distance unless by special arrangement, and when there are definite important matters to discuss. The experiment of a conference was tried two years ago with some success, but there is not adequate machinery in existence to continue the good work started and the finances of the Society have not permitted the expense of calling subsequent conferences to consider arrangements for this and other activities.

Presentation of papers and the exchange of professional experience and thought has often been referred to as one of the most important functions of our Society, as it no doubt is, our shortcomings in this respect have been deplored in annual meeting and have been referred to in several Presidential addresses, but no substantial improvement is visible; indeed, we have rather deteriorated in the number of papers per member. I think it may be taken as a truism that the value of a paper both to the writer and to the members is very largely enhanced by the discussion thereon, and that oftentimes the discussion brings the writer into prominence far more than his original communication, besides giving other members interested a wide range of thought and experience upon the subject. My impression is that by-law No. 48 is seldom lived up to, and that with our present haphazard arrangements, interesting and valuable papers are often read at the Branches that never reach the publications of the Society, and if they do the discussion that took place on their presentation seldom accompanies them. Even

at headquarters the papers are seldom printed sufficiently in advance to get the discussion they deserve. There have been interesting articles contributed by our members to the engineering press that would have enhanced the value of our transactions had they first been read and discussed before the Society, and still might later have found their way to the wider publicity of the technical press. We have probably lost these papers through the feeling that papers presented to the Society are frequently long delayed before publication, and often are not published until they appear in the semi-annual volume. I think it will be agreed that the present procedure almost consigns a paper to oblivion, because few who would read with interest a monthly bulletin or proceedings containing only a few papers for future presentation will read all the transactions en bloc when received in a large volume. Again, there are a number of papers read at local meetings which, while not admissible in the permanent transactions because not sufficiently technical, are nevertheless very interesting, and it seems to me these should reach in some form more members of the Society than happen to hear them at the meeting where they are read.

I feel confident that our transactions could be greatly improved by a more prompt observance of the procedure laid down in by-law No. 48, with the addition of arranging that every paper accepted as worthy to be published in the transactions be first issued in time to permit every member interested to submit a written discussion if he is unable to be present at the reading of the paper. This could easily be arranged by publishing advance copies in the bulletin or proceedings. Papers and lectures that are not sufficiently technical to have a place in the permanent transactions of the Society, but are still of more than local interest should, I think, also be printed in the monthly bulletin or proceedings in order that all of the members of the Society may benefit by their presentation and that the author may reach a larger audience.

The difficulty in the above procedure is that, to make it effective, it would require much time and attention of some one capable of passing on papers, editing for publication and generally attending to the routine of such work promptly.

It is easy to suggest improvements in our service where it now falls so far short of what we all feel it should be, but it is difficult to see how any substantial improvement can be accomplished on our present revenues. A consideration of the balance sheets for several years past shows our revenue dangerously near our expenditure. It is true that this year we have an apparent surplus of revenue of about \$3,600, but this includes entrance fees, and

it must be considered that an exceptional effort to collect arrears has been made for the past two years, that the reservoir of arrears has been heavily drawn upon and will not always be available to make up what might otherwise be a deficit. Moreover, in anticipation of a lower revenue than was actually received, the Finance Committee pared the appropriations to the very lowest limit and the service to our members has been much curtailed. Again, all expenses, particularly those of printing and secretarial service, are rapidly increasing and, through the growth of that very necessary part of our organization, the Branches, the amount returned to the Branches is becoming a heavy tax—last year having amounted to \$2,400.

From an experience gained through an active interest in the Finance Committee for some years past, I believe the Society is being administered economically with the exception perhaps of the collection of arrears. Arrears has been a subject of serious consideration, and is too long to discuss here. I think we may assume, however, that to deal with these too strictly will result in loss of members, in some hardship, and that our average revenues over a period of several years would not be sensibly increased. In my view the members are now getting practically all the service they can expect from the funds at the disposal of the council. In other words, if better service is required it must be paid for and my own feeling is that the Society can not be what we hope it will become until it has sufficient revenue to publish its proceedings and transactions fully and effectively; to maintain an efficient secretarial and clerical staff, capable of promptly editing and issuing advance proofs of transactions and bulletins, and of maintaining such communication with Branches and Divisions as may be necessary to keep all geographical districts of the Society fully informed of the work being carried on. Also, and this I regard as important, of giving such publicity to the work of the Society and the profession, both to our members and to the community, as will assist in the general appreciation of the engineer.

If our members realize, as I am sure they will, that increased revenue is necessary to give the service that should be rendered by a national Society to its members and to the profession it represents. I am confident means will be found to provide the revenue without asking appreciable sacrifice on the part of the members. Possibly it would mean some reduction in the total roll, but those who could not afford to pay would still benefit by the more rapid elevation of the engineer and the general esprit-de-corps engendered in the profession.

I do not think we should ask Students or Juniors to pay any increased fees because the benefits these grades receive from the Society probably do not extend beyond its publications, and the friendships formed through its meetings, also, because as a class they are probably not able to afford a larger subscription; but, as a man rises in his profession to the grade of Associate Membership, he no doubt receives additional benefits and he should, under ordinary circumstances, be able to afford a larger annual subscription. A Member has, we may assume, attained that position in his profession and in the community where any reasonable increase in his dues would be of little financial embarrassment to him and, if the Society is performing all its functions, he should be realizing in addition to the internal benefits, some of the benefits to be expected from the recognition of the engineer by the public both in his profession and in public affairs.

I would, therefore, suggest that Members and Associate Members resident at headquarters who, from their situation, have the use of this building and library, and of the clerical staff in conducting their meetings, should pay larger dues for these privileges; the increase for the Associate Members to be comparatively small, and for Members to be of a very considerable amount, to bring their dues more nearly in accord with those paid by resident members of the American Society of Civil Engineers for equal privileges. Again, I think the general funds of the Society should not, under the difficulties that now confront us, be devoted to the up-keep of Branches beyond the work which is of a general Society nature, such as the publication of reports, the actual clerical work of communicating with headquarters, the payment of delegates' expenses and affairs of a similar kind, leaving all local assessments by the Branches or Divisions to be made as each may determine for itself.

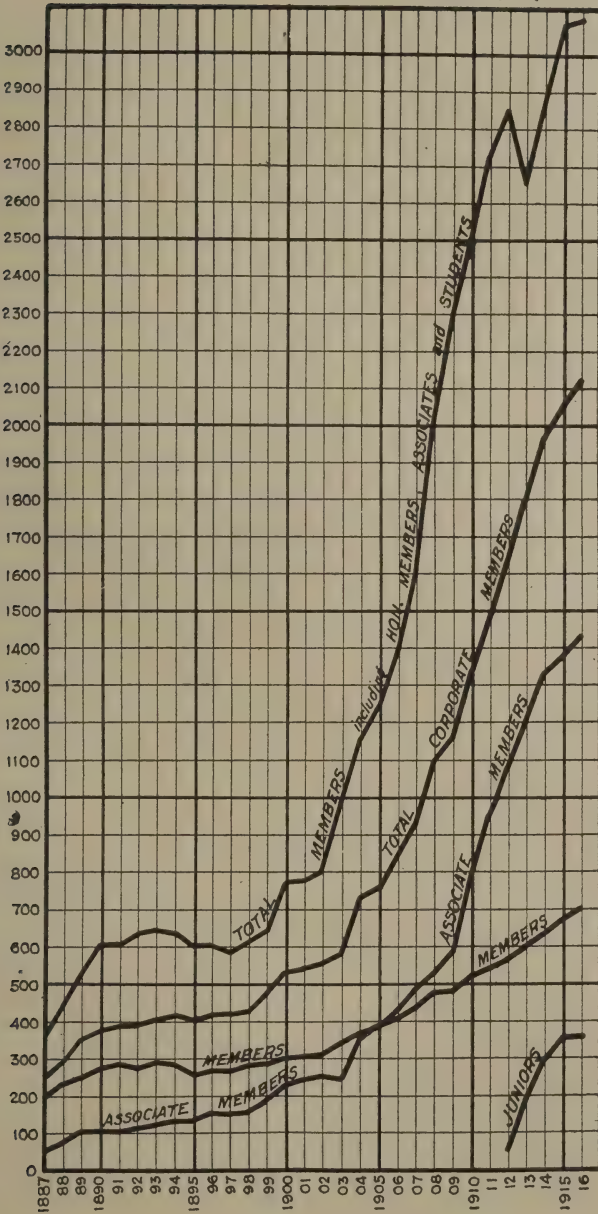
Reference has been made to the important work expected from the Society in the influence it should exert outside its immediate membership. This seems to me to be our real goal, because until governing bodies, corporations, financiers and promoters can be made to realize that success or failure of an undertaking so often depends on the quality of the engineering advice it receives, the value of that advice will not be properly appreciated, and when the public takes the larger view, to which I have referred, and seeks engineers' advice on other than strictly engineering questions, we will have approached that position which will bring the proper standing and emolument to the members of our profession. It is comparatively a new field for concerted action and, in consequence, it does not seem practicable to lay down any definite course that

will land us at the goal. It would seem to be rather a case of seizing every opportunity that offers either to the Society or to the individual to work for that end.

Publicity of the proper kind is undoubtedly very important, and the action of those members in the Calgary Branch and of the committee of rate-paying engineers of Montreal, who gave much time and labour without compensation in a public service, should do much for our cause and is an example of unselfish work for the general good to be highly recommended to those who may have similar opportunities put in their way. Quite recently our Past President, Mr. Tye, has presented a paper requiring a large amount of thought and labour upon a most important public problem. I am sure one of Mr. Tye's rewards will be the knowledge that he has brought the whole profession prominently before the public.

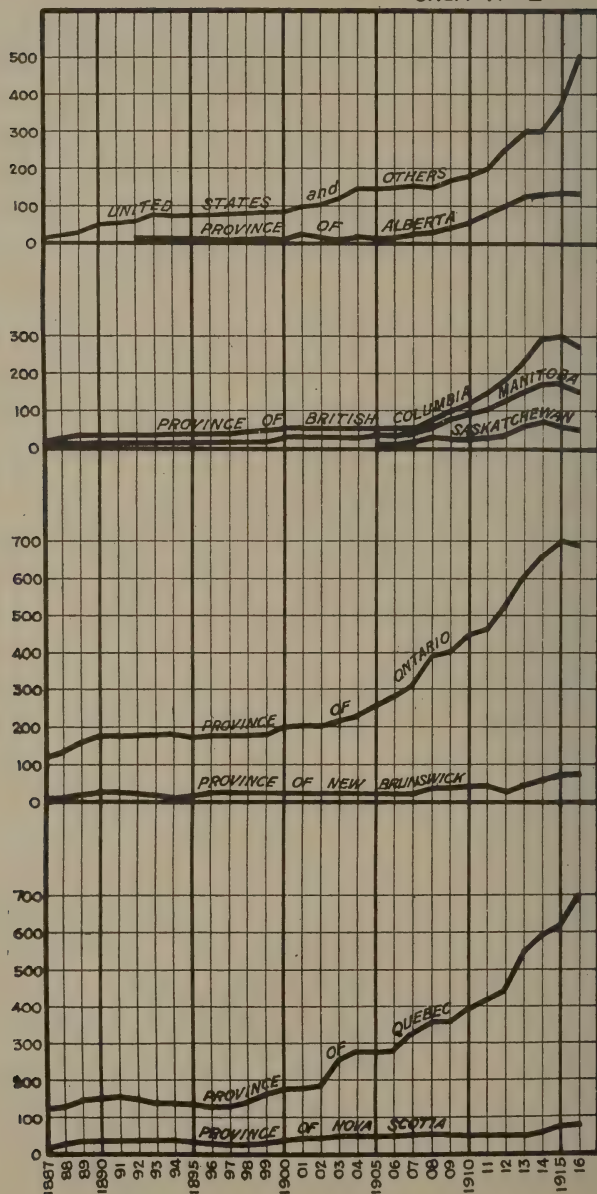
It must not be thought from the foregoing that I am insensible to the public recognition already accorded to members of our profession. We were proud at the last Annual Meeting to congratulate three of our members who had been honoured by Knighthood for distinguished engineering and public services, and we know that other members are on important public commissions.

Chart No 1



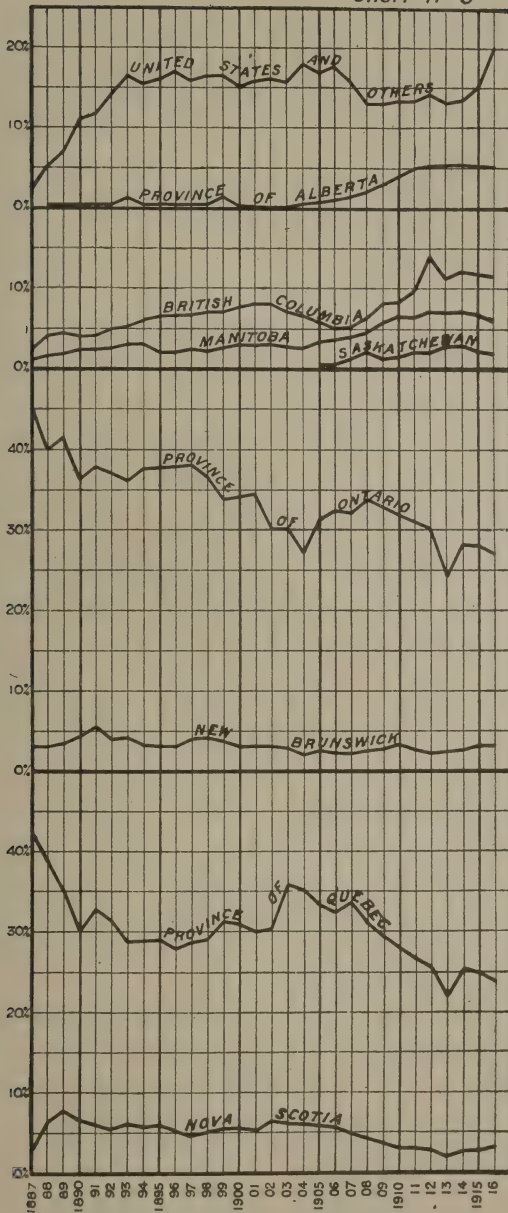
Canadian Society of Civil Engineers.
Chart showing Growth of Membership

Chart No 2



Canadian Society of Civil Engineers
 Chart showing Distribution of Members by Provinces
 [except Students]

Chart No 3



Canadian Society of Civil Engineers

Chart showing Percentage Distribution of Members by Provinces.
[except Students]

TABLE NO. 4.
BRANCHES IN ORDER OF ESTABLISHMENT AND MEMBERSHIP THEREIN EACH YEAR.

(Exclusive of Students.)

Year.	Sydney. Nov. 2, 1905.	Toronto. Oct. 17, 1906.	Manitoba. 1907.	Quebec. 1907.	Ottawa. Jan. 18, 1909.	Vancouver. 1909.	Kingston. 1911.	Victoria. Feb. 12, 1912.	Calgary. Mar. 12, 1913.	Edmonton. May 7, 1914.	Regina. 1915.	Total Branch No. of Members. Branches.	
1905	14	0	0	0	0	0	0	0	0	0	0	14	1
1906	15	58	0	0	0	0	0	0	0	0	0	73	2
1907	0	108	43	41	0	0	0	0	0	0	0	192	3
1908	0	142	64	44	0	0	0	0	0	0	0	250	3
1909	0	155	70	43	108	32	0	0	0	0	0	408	5
1910	0	154	91	51	140	45	0	0	0	0	0	481	5
1911	0	123	106	52	157	89	13	0	0	0	0	540	6
1912	0	152	124	56	183	108	11	58	0	0	0	692	7
1913	0	180	144	70	185	128	11	53	41	0	0	812	8
1914	0	192	175	75	197	137	21	53	51	44	0	945	9
1915	0	211	132	89	210	129	19	63	55	40	23	971	10
1916	0	181	140	89	210	129	19	72	46	43	24	953	10

TABLE NO. 5.
ANNUAL DUES AND REBATES TO BRANCHES

Period Inclusive	RESIDENTS						NON-RESIDENTS						REBATES		
	M. A. M. J.			S. S. A.			M. A. M. J.			S. S. A.			M. A. M. J.		
	A.			S.			A.			S.			A.		
1887 to 1888	-	8	6	...	1	8	\$	\$	\$	\$	\$	\$	\$	\$	\$
1889 to 1902	-	10	8	...	2	10	8	6	...	2	10	2	2	...	0
1903 to 1910	-	10	8	...	2	10	8	6	...	2	10	2	2	...	0
1911 to 1912	-	10	10	6	3	10	8	8	5	2	8	4	4	2	1
1913 to 1917	-	15	12	8	3	15	12	10	6	3	15	4	4	2	1

Entrance and Transfer Fees										Election Qualifications for Members and Associate Members				
Entrance					Transfer					Period	Age	Membership		Prof. Resp.
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$			Prof.	Exp.	
1887 to 1898	-	0	0	...	0	0	0	0	0	1887-1892	-	25	10	5
1899 to 1902	-	20	20	...	0	0	0	0	0	1893-1910	-	30	10	5
1903 to 1910	-	20	10	...	0	0	0	0	0	1911-1917	-	30	12	5
1911 to 1917	-	25	15	10	0	15						Assoc. Membership		
										1887-1908	-	...	5	2
										1909-1911	-	25	6	2
										1912-1917	-	*25	6	2

* Since 1912 an educational qualification of graduation from an engineering school or examination test equivalent thereto has been demanded.

By-Law regarding Provisional Divisions adopted in 1914			S.—Student		A.—Associate		

TABLE NO. 6.
GEOGRAPHICAL DISTRIBUTION OF CORPORATE MEMBERS.

A.	B.	C.	D.	E.	F.	G.	H.
Total Corporate Year Membership	Toronto	Ottawa	Montreal	Area enclosed in lines drawn around Toronto, Ottawa, Montreal	District West of Port Arthur Montreal	District Port Arthur to Montreal	District East of Montreal
1887.... 251	18	37	76	163	18	201	32
	7.4 %	14.8 %	30.4 %	65.0 %	7.4 %	80.5 %	12.8 %
1902.... 562	38	61	165	311	77	195	118
	6.8 %	10.8 %	29.5 %	55.4 %	13.7 %	34.7 %	21.0 %
1916....2,120	153	168	367	777	495	1,383	252
	7.4 %	7.9 %	17.4 %	36.7 %	23.4 %	65.5 %	11.9 %

Note:—"G" is obtained by subtracting "F" and "H" from "A" and is too large by small scattered membership outside of Canada.

PAYMENTS TO BRANCHES FOR REBATES—1906 TO 1916.

Year.	Toronto.	Quebec.	Manitoba.	Ottawa.	Vancouver.	Kingston.	Victoria.	Edmonton.	Calgary.	Regina.	Totals.
1906	\$200.00										\$200.00
1907										No Rebates
1908		\$ 62.00								544.00
1909	\$122.00		\$154.00	\$ 26.00						450.00
1910	58.00	110.00	234.00	66.00						690.00
1911	66.00	152.00	419.50	240.00						1,526.50
1912	125.00	200.00	606.00	340.00	\$ 74.00	\$ 80.50				2,183.50
1913	130.00	300.00	600.00	200.00	50.00	75.00		\$ 40.00		1,980.50
1914	103.00	412.50	600.00	180.50	13.00	91.50		141.50		1,325.75
1915	75.00	186.00	416.25	397.00	57.00	228.75	\$ 69.00	59.00	\$ 35.00	2,526.00
1916	237.75	396.00	464.25	349.50		196.00	94.25	117.00	51.00	3,156.25
Totals	\$3,857.25	\$1,329.75	\$2,424.00	\$3,700.00	\$1,799.00	\$194.00	\$671.75	\$163.25	\$357.50	\$ 86.00	\$14,582.50

Mr. Ross proposed the thanks of the Society be tendered to Mr. Duggan for his instructive address, and for the magnificent work which he had done in the interest of the Society during the year. This motion was seconded by Mr. G. A. McCarthy, and carried with applause.

Mr. G. H. Duggan then resumed the chair.

Mr. H. E. T. Haultain, Chairman of the Committee, presented the following report:—

COMMITTEE ON SOCIETY AFFAIRS.

Montreal, November 20th, 1916.

To the President and Council
of the Canadian Society of Civil Engineers.

PROGRESS REPORT OF COMMITTEE ON SOCIETY
AFFAIRS.

GENTLEMEN,—We have the honour to submit a progress report of the Committee on Society Affairs.

Following the resolution passed at the last Annual Meeting, the Council of the Society proceeded to form a Committee on Society Affairs, and announced that the following gentlemen had been duly elected in conformity with the terms of the aforesaid resolution:—

Representing District No. 1:

Walter J. Francis, 260 St. James Street, Montreal.
Phelps Johnson, Dominion Bridge Company, Montreal.
R. S. Lea, 820 New Birks Building, Montreal.
H. H. Vaughan, Montreal Ammunition Co., Limited, Lachine, Que.
W. F. Tye, Linton Apartments, Sherbrooke St. West, Montreal.
A. Boyer, 519 Canadian Express Building, Montreal.

Representing District No. 2:

D. H. McDougall, Box 2, Sydney, N.S.
W. A. Duff, Engineer of Bridges, T.C. Ry., Moncton, N.B.
L. H. Wheaton, Dept. of Railways and Canals, Dartmouth, N.S.

Representing District No. 3:

A. E. Doucet, T.C. Ry., Quebec, Que.
A. Amos, Hydraulic Service, Parliament Buildings, Quebec, Que.
A. R. Decary, Supt. Engineer Prov. of Quebec, Public Works of Canada, Quebec.

Representing District No. 4:

- John Murphy, Elec. Engr., Dept. of Railways and Canals, 174 MacLaren Street, Ottawa.
 R. de B. Corriveau, Dist. Engr., Public Works of Canada, Royal Bank Chambers, Ottawa.
 G. B. Dodge, Topographic Surveys, Dept. of the Interior, Ottawa.

Representing District No. 5:

- H. E. T. Haultain, University of Toronto, Toronto.
 R. W. Leonard, (Lt.-Col.), St. Catharines, Ont.
 E. W. Oliver, C.N. Ry., Toronto.

Representing District No. 6:

- H. B. Muckleston, Asst. Chief Engr., C.P. Ry., Brooks, Alta.
 W. L. Mackenzie, Engineer's Office, C.N. Ry., Winnipeg.
 A. J. McPherson, Chairman, Local Govt. Board, Prov. of Sask., Parliament Buildings, Regina, Sask.

Representing District No. 7:

- R. F. Hayward, care Western Canada Power Co., Vancouver.
 D. O. Lewis, Dist. Engineer, C.N.P. Ry., Victoria.
 E. A. Cleveland, 1001 Rogers Building, Vancouver.

Following the election of the Committee, Mr. H. E. T. Haultain was elected as Chairman, Lt.-Col. R. W. Leonard, Vice-Chairman, and Mr. E. W. Oliver, Secretary. A meeting of the Committee was held as soon as it was possible to do so and to facilitate the work of the Committee a correspondent was chosen by each of the several Districts recognized by the Society. The correspondents were as follows:—

Representing District No. 1:

- Walter J. Francis, Montreal.

Representing District No. 2:

- L. H. Wheaton, Dartmouth, N.S.

Representing District No. 3:

- A. R. Decary, Quebec, Que.

Representing District No. 4:

- G. B. Dodge, Ottawa.

Representing District No. 5:

- E. W. Oliver, Toronto.

Representing District No. 7:

- D. O. Lewis, Victoria.

A general plan of work was outlined at the same meeting.

The Committee has endeavored systematically to obtain the views of the whole membership regarding the various points on which the Committee is to report. The Council of the Society of its own accord also issued a circular to the whole membership earnestly inviting general co-operation with the Committee.

The work of the Committee has been prosecuted vigorously and a second general meeting of the Committee was held in Montreal on the 17th and 18th of November, when the whole field was carefully reviewed. As a result of the deliberations of this meeting we have the honour to transmit herewith the recommendations which have been so far reached. The recommendations are as follows:—

1st.—The inclusion in the List of Members of a geographical distribution by Districts.

2nd.—The creation of a new classification in membership to be known as “Retired Members,” in which the annual fee will be nominal, for those members over sixty-five years of age who have been Corporate Members of the Society for over twenty years, and who desire to be so classified.

3rd.—The publication of a journal or periodical at least once a month, devoted largely or entirely to the interests of the Society and its members.

4th.—The elimination of interest charges on annual dues for the first six months of the current year, a fixed charge of 50 cents being made for each period of six months thereafter during which the fees remain unpaid.

5th.—Systematic publicity in the public press.

6th.—A systematic effort to have recognized university engineering professors identified with the Society and to secure the co-operation of such universities.

7th.—The engagement as soon as practicable of a Secretary who will devote his whole time to the Society.

8th.—The election of the Nominating Committee and of the Councillors by the Districts.

9th.—The encouragement of the general use of the Society's Standard Specifications by the membership and by municipalities.

10th.—The change of name from Canadian Society of Civil Engineers to "The Canadian Institution of Civil Engineers."

11th.—The re-drafting of the entire by-laws.

12th.—The systematic collection and filing in the library of important engineering reports in Canada, Great Britain, France and the United States.

13th.—The appointment of a Committee to be known as, say, "The Public Service Committee" whose duty it shall be to take cognizance of and report upon any or all public questions or legislation which may appear to be contrary to sound engineering practice or to the interests of our membership.

14th.—The obtaining of annual grants from the Dominion and Provincial Governments.

On behalf of the Committee we would express the hope that these suggestions, which have been reached after very full and complete discussion, may receive the careful consideration of the membership. The Committee has found diversity of opinion on several important points. Some of the more important features of the situation call for further deliberation before the final opinion of the Committee can be expressed.

Other questions have been under consideration, but the deliberations of the Committee have not yet progressed sufficiently to enable definite recommendations to be made regarding them. Several sub-committees are still at work and it is hoped that much useful information may be the result of their deliberations.

The whole is respectfully submitted on behalf of the Committee on Society Affairs.

H. E. T. HAULTAIN,
Chairman.

E. W. OLIVER,
Secretary.

Professor Haultain recommended, especially, on behalf of the Committee the vigorous prosecution of that section of the By-laws which refers to undesirable members.

Mr. E. W. Oliver, as Secretary of the Committee, explained certain procedure in connection with the Committee's work and the difficulties encountered therein.

The report was read and its recommendations were considered clause by clause, with a view to obtaining the approval or disapproval of the Meeting.

On motion by Mr. Walter J. Francis, seconded by Mr. J. S. Dennis, recommendation No. 1 was approved.

On motion by Mr. Walter J. Francis, seconded by Mr. W. F. Tye, recommendation No. 2 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. W. McNab, recommendation No. 3 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. H. V. Brayley, recommendation No. 4 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. R. F. Uniacke, recommendation No. 5 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. M. J. Butler, recommendation No. 6 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. H. V. Brayley, recommendation No. 7 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. J. S. Dennis, recommendation No. 8 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. M. J. Butler, recommendation No. 9 was approved.

Mr. Haultain stated that the 10th clause—that in regard to a change of name for the Society—did not meet with the unanimous approval of the Committee.

After discussion, Colonel W. P. Anderson moved, seconded by Mr. G. A. McCarthy, that the matter of the name of the Society be referred to the Branches for consideration, and that subsequently a letter ballot be taken from all members. Carried.

On motion by Mr. H. E. T. Haultain, seconded by Mr. G. A. McCarthy, recommendation No. 11 was approved.

On motion by Mr. H. E. T. Haultain, seconded by Mr. W. F. Tye, recommendation No. 12 was approved.

Mr. H. E. T. Haultain moved that the recommendation contained in Clause No. 13 be approved. Mr. J. S. Dennis seconded this motion and expressed the hope that the President "will see

fit to appoint a Committee whose special duty it will be to encourage members to deal with these problems, submit papers on them, and that the Society will have their views disseminated in the widest possible manner." Carried.

On motion by Mr. H. E. T. Haultain, seconded by Mr. M. J. Butler, recommendation No. 14 was approved.

DISCUSSION ON REPORT OF COUNCIL.

Consideration of the Report of Council was then taken up.

Mr. James White made certain charges against the Council as to its action in connection with an application for membership which had come before it during the past year. Some discussion in reference to this matter followed, after which Mr. J. S. Dennis, seconded by Mr. H. E. T. Haultain, moved that the Report of Council be adopted. Carried.

The Session then adjourned.

WEDNESDAY FORENOON, 24TH JANUARY, 1917.

A party of some two hundred members were conveyed to Dominion in special electric cars provided by the courtesy of the Montreal Tramways Company. The munition plants of the Dominion Bridge Company, the Montreal Ammunition Company, and the Dominion Copper Products Company were inspected. The members of the party on their return to Montreal were entertained at luncheon by the companies whose works had been visited.

WEDNESDAY AFTERNOON, 24TH JANUARY, 1917.

Mr. G. H. Duggan, President, in the Chair.

Mr. G. C. Parker, as Secretary of the Committee on Roads and Pavements, presented the report of his Committee. The Report, which had been distributed in advance of the meeting, was taken as read.

REPORT OF THE COMMITTEE ON ROADS AND PAVEMENTS

For the Year Ending December 31st, 1916.

MEMBERS OF COMMITTEE.

W. P. Brereton,	A. F. Macallum,
F. W. Doane,	A. J. McPherson,
J. Duchastel,	P. Mercier,
J. E. Griffith,	W. P. Near,
G. Henry,	G. C. Powell,
E. A. James,	C. H. Rust,
W. A. McLean, Chairman.	

"The work of the Committee during the past year has been confined chiefly to the following:—

1. The collection of data concerning the construction of various types of roads and streets.
2. The formulating of specifications for the supply of crushed stone, gravel and sand.
3. The formulating of a tentative specification for three grades of asphaltic road oils.

The report of this Committee for 1915 stated that printed forms would be sent to the municipal engineers throughout the Dominion with a view to securing data concerning the construction of pavements of various types. From year to year separate forms were to be sent on which data concerning the service rendered by these pavements would be itemized. Drafts of the proposed forms were shown in Appendix I of the 1915 report.

On further consideration it was decided to revise both forms and while the changes in the forms for recording data concerning construction were of a minor nature, consisting for the most part in a change in arrangement of items, that for recording data concerning the history of pavements was entirely revised. In place of the general information indicated on the original form the information has been itemized in detail. This will insure greater uniformity in the manner in which the information is received as well as facilitating the filling

out of the forms by the engineers who are co-operating with the Committee.

During the early part of the summer six copies of the form entitled "Data Concerning the Construction of Pavement" were sent to engineers in each of forty-three cities and towns in the Dominion as well as to members of the Committee. A number of these have not been returned owing to changes of address of the engineers, the lack of detailed data or the absence of permanent street improvement in a number of municipalities. Hearty co-operation, which has been appreciated by the Committee, has been received from a number of engineers, and much valuable information has been collected. Further co-operation is desired by the Committee during the coming year.

The forms were sent out during the construction season and while a number of engineers expressed their willingness to furnish the information desired, they found it impossible to devote the time to the collection of it on account of the pressure of work. It is the intention of the Committee that copies of both forms be in the hands of engineers shortly after the beginning of the new year, as at this period of the year more time is available for attention to office duties and the records of the previous season's work are still accessible. A list of the municipalities from which reports have been received, with the general location of the streets reported on and the type of pavement laid, is shown in Appendix I.

SPECIFICATIONS FOR THE SUPPLY OF MATERIALS.

The formulating of specifications for natural products, such as crushed stone, gravel, and sand, which can be directly used in all localities, is impossible. In many localities the greater portion of the cost of these materials is that paid for transportation. Hence material of high quality which can be procured within short distance of the work in one locality would reach a prohibitive cost in another.

The Committee has therefore endeavoured to draw up specifications which cover materials of good quality under normal commercial and natural conditions. It is recognized that in some districts these specifications as they stand will not be applicable, but the ideal striven for has been to secure a specification that may be a guide, from which specifications best suited to local conditions can be drafted.

The classifying of materials into different grades according to qualities reduces the necessity of redrafting the specifications. In localities where materials of certain grades cannot be secured economically and the nature of the work permits the use of material of inferior qualities, it will only be necessary to specify the particular grade required, when the specifications for work are drafted.

The extensive use of laboratory tests results may be considered inadvisable by some engineers. At the present time laboratories are not available in all municipalities, but resort to laboratory tests is rapidly growing and even at the present time tests are being conducted by some of the universities in the Dominion. It is felt that it is only a matter of time till every large municipality will submit all materials to laboratory test prior to accepting them.

The properties assigned to the different grades have been selected from the study of results of tests made under the direction of the Chairman of the Committee as well as from the study of the results of tests conducted by various highway organizations.

In reading the specifications it must be borne in mind that they are for the supply of materials only. The classes of work in which the materials are to be used, unless such materials are confined only to such classes, have not been stated. The specifications for the construction of various types of pavements will state definitely the class, size, etc., of the materials which are to enter into the construction of the particular pavements.

Drafts of the specifications as considered by the members of the Committee residing in Toronto were sent to all members. Where suggestions regarding changes in minor points were made these have been incorporated, but where changes of importance have been suggested these are indicated at the end of each specification in order that they may receive the consideration of the Society. The specifications are shown in Appendix II.

SPECIFICATIONS FOR BITUMINOUS MATERIALS.

The Committee also begs to report progress in the drafting of specifications for the supply of bituminous materials. The rapidly increasing use of these materials for the protection of road surfaces renders it advisable that a reliable specification be in the hands of engineers at the earliest moment.

Work was commenced on three grades of asphaltic road oils, but at the same time it was realized that there were a number of other grades of this material as well as refined tars, etc., favoured by engineers. The specifications submitted in Appendix III have not been placed before all the members of the Committee and are therefore to be considered as a progress report only.

It is the intention of the Committee that a series of general clauses be drawn up which will take into consideration suggested form of tenders, suggested system of payments and methods of inspection of materials. The tentative specifications for asphaltic oils are shown in Appendix III.

APPENDIX I.

LIST OF PAVEMENTS REPORTED ON.

Municipality.	Street or Road.	Pavement Laid.
Montreal South, Que.	Rainville Bvd.....	Concrete.
" " "	Desaulniers Bvd.....	Asphaltic Concrete on 5" Concrete.
St. Lambert, Que.	Victoria Ave.....	Bitulithic on 5" Concrete.
" " "	Desaulniers Bvd.....	Bitulithic on 5" Concrete.
Westmount, Que.	Upper Belmont.....	Sheet Asphalt on 6" Concrete.
" " "	Wood St.....	Sheet Asphalt on 6" Concrete.
Quebec Province.....	King Edward H'way...	Bituminous Macadam.
" " "	Sherbrooke to Derby line.....	Tar Macadam.
Quebec City.....	DeSalaberry.....	Granite Block on 6" Concrete.
" " "	Salaberry St.....	Asphaltic Concrete on 6" Concrete.
" " "	St. Louis.....	Sheet Asphalt on 6" Concrete.
" " "	Hermure.....	Asphaltic Concrete on 6" Concrete.
" " "	Hamel.....	Asphaltic Concrete on 6" Concrete.
Stratford, Ont.....	Wellington.....	Tar Filled Macadam on 5" Concrete.
" " "	William.....	Tar Filled Macadam on 5" Concrete.
York County, Ont.....	Vaughan Rd.....	Tar Macadam.
" " "	Yonge St.....	Waterbound Macadam.
North Bay, Ont.....	McIntyre.....	Waterbound Macadam.
Welland, Ont.....	N. Main.....	Wood Block on 5" Concrete.
" " "	Cross.....	Brick on 5" Concrete.
" " "	Hellems Ave.....	Brick on 5" Concrete.
" " "	Division.....	Brick on 5" Concrete.
" " "	S. Main.....	Brick on 6" Concrete.
" " "	Catherine St.....	Brick on 6" Concrete.
" " "	W. Main.....	Brick on 6" Concrete.
" " "	E. Main (2 sections)...	Brick on 6" Concrete.

Victoria, B.C.	Cormorant	Sheet Asphalt on 6" Concrete.
" "	Richmond Ave	Sheet Asphalt on 5" Concrete.
" "	Cormorant	Sheet Asphalt on 6" Concrete.
" "	Richmond Ave	Sheet Asphalt on 5" Concrete.
Oshawa, Ont.	Richmond	Concrete.
" "	Simcoe	Concrete.
Toronto, Ont.	Grace Terrace	Bitulithic on 5" Concrete.
" "	St. John's Rd	Bitulithic on 5" Concrete.
" "	Keele St	Bitulithic on 5" Concrete.
" "	Quebec Ave	Sheet Asphalt on 5" Concrete.
" "	Keele St	Sheet Asphalt on 5" Concrete.
" "	Earl St	Sheet Asphalt on 5" Concrete.
" "	Alberta Ave	Sheet Asphalt on 5" Concrete.
" "	Main St	Sheet Asphalt on 6" Concrete.
" "	Wellington St. W	Sheet Asphalt on 6" Concrete.
" "	Christie St	Sheet Asphalt on 8" Concrete.
" "	Alexandra Bvd	Concrete, 6" thick.
" "	Glencairn Ave	Concrete, 6" thick.
" "	Lytton Bvd	Concrete, 6" thick.
" "	Bracondale Hill Rd	Brick on 5" Concrete.
" "	Bain Ave	Brick on 5" Concrete.
" "	Scarborough Rd	Brick (hillside) on 5" Concrete.
" "	Wells St	Asphaltic Concrete on old Macadam foundation.
Kingston, Ont.	Aberdeen St	Bituminous Concrete on 4" Concrete.
" "	William St. (3)	Bituminous Concrete on 4" Concrete.
London, Ont.	Ridout St. (2)	Asphaltic Concrete on 6" Concrete.
" "	York St	Asphaltic Concrete on 6" Concrete.
" "	Bradford St	Concrete.

APPENDIX II.

STANDARD SPECIFICATION ROADS AND PAVEMENTS FOR CONSIDERATION AT THE ANNUAL MEETING, 1917.

ITEM 1.—CRUSHED STONE.

Definition.

1-1.—Crushed stone shall be bedded rock or boulders which have been broken by mechanical means into fragments of varying shapes and sizes. It shall not contain more than 10 per cent. by weight of soft or friable material. Material of which the particles are coated with dirt or have the edges worn off will not be accepted.

Weathered Stone.

1-2.—No crushed stone shall be accepted which shows signs of being disintegrated or reduced in quality by the action of the weather.

Crusher Run.

1-3.—Crusher run shall be the product of the crusher, of which not more than 8 (eight) per cent. by weight shall pass a $\frac{1}{4}$ (one-quarter) inch opening.

Sizes of Stone.

1-4.—The following schedule of sizes shall be used, with the percentages of material larger than the maximum and smaller than the minimum openings respectively, as shown. The sizes of opening shall mean the diameter of circular openings in steel or iron plates. The percentages shall be determined by weight.

The sizes of stone with the openings by which they are obtained are as follows:—

Name of size.	Maximum size of opening in inches.	Maximum per cent. retained by max. size of opening.	Minimum size of opening in inches.	Max. per cent. passing minimum size of opening.
5 inch	5	3	4	8
4 "	4	3	3	8
3 "	3	3	2½	8
2½ "	2½	5	2	10
2 "	2	5	1½	10
1½ "	1½	5	1	15
1 "	1	5	½	15
½ "	½	7	¼	15

Screenings.

Screenings shall be material all of which shall pass a $\frac{1}{4}$ (one-quarter) inch screen.

Mineral Dust.

Mineral dust shall be finely pulverized stone of which not less than 80 (eighty) per cent. by weight shall pass a 200 mesh screen.

Tests on Stone.

1-5.—In addition to fulfilling the foregoing requirements, crushed stone shall be classed into three grades, according to qualities which shall be determined by tests conducted in a properly equipped laboratory. The properties determined shall be: coefficient of wear, toughness, and absorption. Material meeting the requirements of any of the grades with respect to coefficient of wear and toughness but failing to meet the requirement with respect to absorption may, on consideration of the Engineer, be classed with the higher grade.

Grades of Crushed Stone.

Crushed stone shall be classed under one of the following grades:—

1-6.—*Grade "A"* is a rock which has a toughness of not less than 18 (eighteen), a coefficient of wear of not less than 14 (fourteen), and an absorption of not more than 0.6 (six-tenths) pounds per cubic foot.

1-7.—*Grade "B"* is a rock which has a toughness of not less than 10 (ten), a coefficient of wear of not less than 7 (seven), and an absorption of not more than 1.0 (one) pound per cubic foot.

1-8.—*Grade "C"* is a rock which has a toughness of not less than 7 (seven), a coefficient of wear of not less than 5 (five) and an absorption of not more than 1.5 (one and five-tenths) pounds per cubic foot.

1-9.—*Grade "D"* is a rock that does not meet the requirements of any of the above grades and which may be used only on consideration by the Engineer.

ITEM 2.—GRAVEL.

Definition.

2-1.—Gravel shall consist of naturally formed fragments of tough durable rock, well graded in size from the smallest to the largest, free from flat, elongated particles, and shall not contain more than 15 per cent. by weight of soft friable material. It shall not contain an excess of clay nor an excess of loose or adhering dust, vegetable loam or other deleterious matter. It shall be satisfactory to the Engineer in all respects.

Screened Gravel.

2-2.—“Screened gravel” is gravel fulfilling the above requirements which is screened into one or more of the sizes defined in Section 1-4 of the “Specifications for Crushed Stone.”

2-3.—“Run of bank gravel” is gravel fulfilling the requirements of Sec. 2-1 of this specification, which shall be classed under one of the three grades shown below according to qualities determined in a properly equipped laboratory. The properties determined shall be the coefficient of wear and the proportions of the various sizes of particles present.

The coefficient of wear shall be determined on material passing a screen having circular openings 2 (two) inches in diameter and retained by a screen having circular opening $\frac{1}{2}$ (half) inch in diameter. The test shall be conducted in the same manner as that for determining the coefficient of wear of crushed stone. Run of bank gravel shall be classed according to the following grades:—

2-4.—Grade “A” is a run of bank gravel containing a large percentage of pebbles of igneous rocks. It shall not contain more than 5 (five) per cent. by weight of material which shall be retained on a screen having 4 (four) inch circular openings, and not more than 45 (forty-five) per cent. by weight of material which shall pass a screen having $\frac{1}{4}$ (one-quarter) inch square openings. It shall not contain more than 3 (three) per cent. by weight of clay or loam nor have a coefficient of wear of less than 14 (fourteen).

2-5.—Grade “B” is a run of bank gravel containing a smaller percentage of igneous rock pebbles. It shall not contain more than 5 (five) per cent. by weight of material which is retained by a screen having 4 (four) inch circular openings nor more than 60 (sixty) per cent. by weight of material retained by a screen having $\frac{1}{4}$ (one-quarter) inch square openings. It shall not contain more than 9 (nine) per cent. by weight of clay or loam nor have a coefficient of wear of less than 11 (eleven).

2-6.—Grade “C” is a run of bank gravel composed chiefly of pebbles of sedimentary rock. It shall not contain more than 5 (five) per cent. by weight of material which is retained on a screen having 4 (four) inch circular openings, and not more than 80 (eighty) per cent. by weight of material which passes a screen having $\frac{1}{4}$ (one-quarter) inch square openings. It shall not contain more than 12 per cent. by weight of clay or loam nor have a coefficient of wear of less than 7 (seven).

2-7.—Grade “D” is a run of bank gravel which does not meet the requirements of any of the above grades and which may be used only by written permission of the Engineer.

2-8.—When so directed by the Engineer, gravel shall be crushed. The material so produced shall conform to the requirements of "screened gravel" or "Run of bank gravel" as directed by the Engineer.

ITEM 3.—SAND.

Concrete Sand.

3-1.—Fine aggregate for concrete shall consist of natural sand, composed of hard, tough, durable particles, graded from fine to coarse. When dry, not more than 5 (five) per cent. shall be retained on a sieve having 4 (four) meshes per lineal inch; not more than 20 (twenty) per cent. by weight shall pass a sieve having 50 (fifty) meshes per lineal inch, and not more than 4 (four) per cent. shall pass a sieve having 100 (one hundred) meshes per lineal inch. It shall not contain more than 3 (three) per cent. by weight of clay or loam.

Mortar Tests.

3-2.—Sand in addition to meeting the above requirements shall give a mortar strength equal to or higher than the minimum value at any of the ages shown in the following table:—

Age at Test.	Minimum strength of 1:3 mortar.
72 hours	1.25 times A
7 days	1.10 times A
28 days	1.00 times A

Where "A" is the strength of 1:3 standard Ottawa sand mortar specimens of same form and size made by the same operator using the same cement and the same amount of water.

The tests shall be made on mortars composed of 1 (one) part Portland Cement and 3 (three) parts of fine aggregate or standard Ottawa sand, by weight. The test specimens shall be made, stored and tested in the same manner, under approved laboratory conditions and according to recognized standards of practice. Each value shall be the average from tests of no fewer than 3 (three) specimens.

Cement.

3-3.—The cement used in all tests shall meet the requirements of the Specifications for Portland Cement of the Canadian Society of Civil Engineers, as revised in 1916.

Stone Screenings.

3-4.—Stone screenings from a hard, tough, durable rock may be used as fine aggregate by written permission of the Engineer and provided it meets the requirements of mortar strength.

Sand for Bituminous Construction.

3-5.—Sand for use in bituminous pavement construction shall consist of hard, tough, durable particles. It shall not contain more than 1 (one) per cent. of clay or loam. When dry, not more than 8 (eight) per cent. shall be retained on a sieve having 8 (eight) meshes per lineal inch, and shall not vary more than 5 (five) per cent. from the following:—

Screen Mesh per lineal inch.	Percentage by Weight retained.
8	10
30	20
50	27
80	20
100	15
200	7
	1
	<hr/>
	100 Pass

Cushion Sand.

3-6.—Cushion sand shall be clean and sharp, and not more than 10 (ten) per cent. by weight shall be retained on an 8 (eight) mesh sieve. It shall not contain more than 10 (ten) per cent. by weight of clay or loam.

Grout Sand.

3-7.—Grout sand shall be clean, sharp and well graded. Not more than 8 (eight) per cent. by weight shall be retained on a 20 (twenty) mesh sieve, and not more than 30 (thirty) per cent. on a 100 (one hundred) mesh sieve. It shall not contain more than 5 (five) per cent. of clay or loam.

Mortar made in the proportion of 1 (one) part of cement to 3 (three) parts of sand by weight shall show a tensile strength at least equal to 40 (forty) per cent. of a similar mortar made of standard Ottawa sand, mixed in the same proportions and stored and tested in the same manner.

APPENDIX III.

TENTATIVE SPECIFICATIONS FOR ASPHALTIC ROAD OILS.

General.

Asphaltic oils shall be classed into three grades, each containing the minimum percentage by weight of asphalt, of 50 degrees penetration, as follows:—

Light oil shall not contain less than 40 per centum asphalt.

Medium oil shall not contain less than 60 per centum asphalt.

Heavy oil shall not contain less than 80 per centum asphalt.

All oil, in addition to meeting the requirements of one of the above grades, shall have the following characteristics as determined in the laboratory. All tests shall be conducted according to the latest methods recommended by the American Society for Testing Materials.

The requirements are as follows:—

1. It shall be obtained by the refining of asphaltic or semi-asphaltic petroleum or by the combination of solid or semi-solid native asphalts with asphaltic petroleum or derivatives thereof, which melt on the application of heat.
2. The various hydrocarbons composing it shall be present in a homogeneous solution.
3. It shall be free from water and sediment.
4. It shall not contain acid nor sulphur in sufficiently large quantities to attack rubber or rubber compositions.

Light Oil.

Light oil shall have the following characteristics:—

1. It shall have a specific gravity of not less than 0.92 (Ninety-two one hundredths) at 77 degrees Fahrenheit (25 degrees C.).
2. When evaporated in an open vessel at a temperature between 450 and 500 degrees Fahrenheit until the residue remaining has a penetration (5 seconds, 77 degrees Fahrenheit, No. 2 needle, 100 grams) of 50 (fifty) degrees, the residue shall meet the following requirements:—
 - (a) It shall amount to not less than 40 (forty) per centum and not more than 50 (fifty) per centum of the original oil by weight.
 - (b) It shall have a ductility at 77 degrees Fahrenheit of not less than 25 (twenty-five) centimetres (Dow mould).
 - (c) It shall have a melting point of not more than 160 (one hundred and sixty) degrees Fahrenheit and not less than 130 (one hundred and thirty) degrees Fahrenheit when tested by the ball and ring method.
3. Fifty grams of the oil upon being maintained at a temperature of 325 degrees Fahrenheit for 5 hours in a cylindrical vessel $2\frac{3}{4}$ inches in diameter and $1\frac{1}{2}$ inches deep shall not lose more than 25 (twenty-five) per centum nor less than 10 (ten) per centum by weight.
4. It shall be soluble at air temperature in pure carbon bisulphide to the extent of not less than 99.0 (ninety-nine) per centum.
5. It shall be soluble at air temperature in 76 degrees Beaume paraffin petroleum naphtha distilling between 140 and 190 degrees

Fahrenheit to the extent of not less than 85 (eighty-five) per centum and not more than 95 (ninety-five) per centum.

6. It shall yield not more than 8 (eight) per centum by weight of fixed carbon on ignition.
7. It shall show a flash point of not less than 120 (one hundred and twenty) degrees Fahrenheit when tested in an open cup.
8. It shall not contain more than 5 (five) per centum by weight of paraffin scale.

Medium Oil.

Medium oil shall have the following characteristics:—

1. It shall have a specific gravity of not less than 0.94 (ninety-four one hundredths) at 77 degrees Fahrenheit.
2. When evaporated in an open vessel at a temperature between 450 and 500 degrees Fahrenheit until the residue has a penetration (5 sec., 77 degrees Fahrenheit, No. 2 needle, 100 grams) of 50 degrees, the residue shall meet the following requirements:—
 - (a) It shall amount to not less than 60 (sixty) per centum and not more than 70 (seventy) per centum by weight of the original oil.
 - (b) It shall have a ductility at 77 degrees Fahrenheit of not less than 25 centimetres (Dow mould).
 - (c) It shall have a melting point of not more than 160 (one hundred and sixty) and not less than 130 (one hundred and thirty) degrees Fahrenheit, when tested by the ball and ring method.
3. Fifty grams of the oil upon being maintained at a temperature of 325 degrees Fahrenheit for 5 hours in a cylindrical dish $2\frac{3}{4}$ inches in diameter and $1\frac{1}{2}$ inches deep, shall not lose more than 12 (twelve) per centum nor less than 7 (seven) per centum by weight.
4. It shall be soluble at air temperature in pure carbon bisulphide to the extent of not less than 99.0 (ninety-nine) per centum by weight.
5.
 - (a) It shall be soluble at air temperature in 76 degrees Beaume paraffin petroleum naphtha to the extent of not less than 83 (eighty-three) per centum and not more than 90 (ninety) per centum.
 - (b) When 20 C.C.'s of naphtha solution, obtained by treating 1 gram of oil with 100 C.C.'s of 76 degrees Beaume petroleum paraffin naphtha at air temperature, is evaporated upon a glass plate, the residue shall be adhesive and sticky, but not oily.
6. It shall yield between 8 (eight) per centum and 12 (twelve) per centum by weight of fixed carbon on ignition.

7. It shall show a flash point of not less than 150 (one hundred and fifty) degrees Fahrenheit when tested in an open cup.
8. It shall not contain more than 5 (five) per centum by weight of paraffin scale.

Heavy Oil.

Heavy oil shall have the following characteristics:—

1. It shall have a specific gravity of not less than 0.96 (ninety-six one hundredths) at 77 degrees Fahrenheit (25 degrees Cent.).
2. When evaporated in an open vessel at a temperature between 450 and 500 degrees Fahrenheit until the residue has a penetration (5 seconds, 77 degrees Fahrenheit, No. 2 needle, 100 grams) of 50 (fifty) degrees the residue shall have the following requirements:—
 - (a) It shall amount to not less than 80 (eighty) per centum by weight of the original oil.
 - (b) It shall have a ductility at 77 degrees Fahrenheit of not less than 40 (forty) centimetres.
 - (c) It shall have a melting point of not more than 160 (one hundred and sixty) and not less than 130 (one hundred and thirty) degrees Fahrenheit when tested by the ball and ring method.
3. Fifty grams of the oil upon being maintained at a uniform temperature of 325 degrees Fahrenheit for 5 hours in a cylindrical vessel, $2\frac{1}{4}$ inches in diameter by $1\frac{1}{2}$ inches deep, shall lose not more than 5 (five) per centum by weight.
4. It shall be soluble at air temperature in pure carbon bisulphide to the extent of not less than 99.0 (ninety-nine) per centum by weight.
5. (a) It shall be soluble at air temperature in 76 degrees Beaume paraffin petroleum naphtha to the extent of not less than 75 (seventy-five) per centum and not more than 90 (ninety) per centum by weight.
 - (b) When 20 C.C.'s of naphtha solution, obtained by treating 1 gram of oil with 100 C.C.'s of 76 degrees Beaume petroleum paraffin naphtha at air temperature, is evaporated upon a glass plate, the residue shall be adhesive and sticky but not oily.
6. It shall yield between 8 (eight) per centum and 14 (fourteen) per centum by weight of fixed carbon on ignition.
7. It shall have a flash point of not less than 290 degrees Fahrenheit when tested in an open cup.
8. It shall not contain more than 5 (five) per centum by weight of paraffin scale."

Mr. Parker moved that appendices 1 and 3 of the report of the Committee on Roads and Pavements be received, that appendix 2 be received and recommended to the Society for guidance, not as a standard specification. The Committee to be continued for the ensuing year. This motion was seconded by Mr. G. A. Mountain and carried.

The following report of the Electro-Technical Committee was presented.

THE INTERNATIONAL ELECTRO-TECHNICAL COMMISSION.

MEMBERS OF COMMITTEE.

H. T. Barnes,	J. Murphy,
L. W. Gill,	T. R. Rosebrugh,
J. Kynoch,	A. B. Lambe, Secretary.

L. A. Herdt, Chairman.
O. Higman, Vice-Chairman.

"This Committee begs to report that during the year 1916 the work of the Commission, as in 1915, has been more or less restricted, due, of course, to the war, which must of necessity materially affect all international bodies.

In June, however, we had the pleasure of a visit from Mr. C. Le Maistre of London, England, the General Secretary of the Commission, our committee meeting in Ottawa and discussing with Mr. Le Maistre various matters relating to the Commission's present and future activities. At that meeting Mr. Le Maistre stated that while matters naturally could not go ahead in just the same way as formerly, still everything possible was being done by the Central Office and the various sub-committees to put things in shape so that material progress can be made shortly after conditions return to normal.

Mr. Le Maistre also spent considerable time in the States in consultation with the American Committee and the American Institute of Electrical Engineers, meeting them on behalf of both the Commission and the British Engineering Standards Committee, of which latter body Mr. Le Maistre is also a member, and has since been made Secretary. His visit will undoubtedly materially advance the cause of international standardization.

Nothing has, of course, been done during the past year towards the holding of any further Congresses. Presumably the 1917 meeting, originally scheduled to be held in Petrograd, will be postponed.

We have pleasure in reporting that Prof. L. W. Gill, the member of the Canadian Committee who is at the Front, continues to command a battery somewhere in France.

With the exception of Mr. W. A. Duff of Winnipeg, who, we are sorry to say, resigned during the year, the committee remains as before."

On motion by Dr. L. A. Herdt, seconded by Mr. J. A. Jamieson, the report was adopted.

The following report on Steel Bridge Specifications was presented by Mr. P. B. Motley.

REPORT OF THE COMMITTEE ON STEEL BRIDGE SPECIFICATIONS.

MEMBERS OF COMMITTEE.

W. A. Bowden.	N. M. McLeod.
G. H. Duggan.	F. C. McMath.
H. G. Kelley.	C. N. Monsarrat.
J. G. Legrand.	F. P. Shearwood.

P. B. Motley, Chairman.

"This Committee has had twenty meetings during the year, which have been attended by most of the Montreal members, the others having participated by letter, and a draft specification has been made and sent out to the Branches for discussion.

It is recommended that the discussion of this draft be continued during the coming year, so that the views of all interested authorities may be obtained, with a view to having the specification take such form as to make it possible for provincial, municipal and other bodies to adopt it. In the meantime it is proposed that the Committee continue its work, including the preparation of a specification for Moveable Bridges and the revision, where necessary, of the present Railway Bridge Specification.

In addition to the foregoing, it is respectfully suggested that the Committee automatically go out of office every two years and that its personnel be chosen as follows: One representative from each of the Branches and four members residing at or near headquarters. This arrangement would have the effect of providing, at all times, a working Committee, which would prepare details for discussion by the Committee as a whole.

While Moveable Bridges have not been included in the preliminary drafts of the Highway Bridge Specification and were not included in the Railway Bridge Specifications that have been issued, the Committee has given some consideration to this feature, as it is felt to be necessary for complete specifications. The Committee feels that a Mechanical and an Electrical Engineer conversant with moveable bridge practice would be of great service in this connection, and suggests that the new Committee be empowered to add to its number or to consult such experts as may be necessary to draft a complete specification."

On motion by Mr. Walter J. Francis, seconded by Mr. P. B. Motley, the report was received.

Some discussion followed, and Mr. P. B. Motley moved, seconded by Mr. G. A. Mountain, that the Committee be continued for another year, and be empowered to add to its membership on the basis of the suggestions made in the report.

REPORTS OF EXAMINATION COMMITTEE AND OF COMMITTEE ON EDUCATIONAL REQUIREMENTS.

MEMBERS OF COMMITTEES:

Examination Committee.	Committee on Educational Requirements.
MacKay, H. M., Chairman.	Marceau, E., Chairman.
Surveyer, A., Secretary.	Holgate, H.
Beullac, M.	Irwin, H.
Fairbairn, J. M. R.	Leonard, R. W.
Flahault, J.	MacKay, H. M.
Lea, R. S.	Porter, J. B.
Roberts, A. R.	Surveyer, A.
	Tye, W. F.

Mr. H. M. MacKay reported on behalf of the Examination Committee. He stated that the work for the year had been very light, no candidates had been examined under Schedule A, four candidates were examined under Schedule B, of these three had passed and one failed. Two candidates were examined under Schedule C, one of whom attained the required standard.

Mr. H. M. MacKay also reported on behalf of the Educational Requirements Committee that the work of the year consisted in examining certificates of candidates and advising in regard to their educational status.

Mr. H. M. MacKay moved the adoption of these reports, seconded by Mr. M. J. Butler. Carried.

Mr. A. Surveyer presented the following report of the Committee on Sewage Disposal and Sanitation.

REPORT OF SEWAGE DISPOSAL AND SANITATION COMMITTEE.

MEMBERS OF COMMITTEE :

Sir John Kennedy,	A. J. McPherson,
W. Chipman,	A. F. Macallum,
P. Gillespie,	J. O. Meadows,
Théo. Lafrènière,	W. Muir Edwards,
R. S. Lea,	C. H. Rust,
W. S. Lea,	

Arthur Surveyer, Chairman.

GENTLEMEN:—

"It was decided last year that sub-committees of this Committee should be formed in each Province in order to approach the different Boards of Health in an effort to induce them to adopt some of the suggestions made by your Committee in 1915 and approved by the annual meeting.

With this end in view Messrs. Andrew F. Macallum, A. J. McPherson, W. Muir Edwards and C. H. Rust were appointed chairmen of the sub-committees for Ontario, Saskatchewan, Alberta and British Columbia, respectively, the Quebec sub-committee consisting of Sir John Kennedy, Messrs. Théo. J. Lafrènière, R. S. Lea, W. S. Lea, J. O. Meadows and the writer.

On the 23rd of June, a delegation from this sub-committee met by appointment the Superior Board of Health of the Province of Quebec and urged upon the Board the advisability of amending the Quebec Public Health Act so as to embody the following suggestions:—

1.—That at least two engineers should be members of the Quebec Superior Board of Health.

2.—That all reports or plans submitted to the Board should be signed by an engineer qualified to practise in the Province of Quebec.

3.—That rules should be drafted to cover the preparation and submission of projects.

4.—That no by-law providing for the raising of money for the construction, alteration or extension of any works coming under the jurisdiction of the Board of Health should be submitted to the votes of the electors without first being approved by the Board of Health.

5.—That extensions or alterations to existing works should be submitted to the Board of Health for approval, just the same as new works.

Our delegation was well received by the Board of Health and consideration was promised. Since that date the term of office of three of the members has expired. Mr. R. S. Lea, member of this Society, was reappointed on the Board, but notwithstanding the fact that we urged by letter upon the president of the Superior Board of Health the advisability of filling one of the two other vacancies by an engineer, two doctors were appointed. The personnel of the Board remains as heretofore, viz., eight doctors, one dentist and one civil engineer. It is fair to say, however, that the appointments are made by the Governor-in-Council and not directly by the Superior Board of Health.

At the last session of the Quebec Legislature the Quebec Public Health Act was amended, but none of the amendments were in the line of our suggestions except one, which followed to some extent our last recommendation. It is the writer's belief, however, that the members of the Board of Health had already decided that this amendment was desirable before we approached them.

Since our visit we understand that the Board of Health has taken up the study of regulations to cover the preparation and submission of projects. We cannot, however, claim a very great success, as our most important recommendations have not been acted upon. It is possible, however, that although loath to take the initiative, the Superior Board of Health might adopt a neutral attitude towards some of these recommendations if the Society were to bring them up to Legislature as amendments to the Public Health Act. The question which this meeting has to decide is whether or not the Society, following up its last year's manifestations of interest in public affairs, should move a step further ahead and offer amendments to the laws of the country when it feels that these amendments are for the general welfare of the community."

Mr. A. Surveyer moved that this report be received and the Council be instructed to appoint a Committee on Legislation to take up the legislative matter referred to therein and other similar difficulties. The motion was seconded by Mr. J. A. Jamieson and carried.

Mr. Walter J. Francis presented the following report on Reinforced Concrete.

PROGRESS REPORT OF COMMITTEE ON CONCRETE AND
REINFORCED CONCRETE.

Montreal, January 20th, 1917.

To the President, Council and Membership
of the Canadian Society of Civil Engineers.

Gentlemen,—

The Committee on Concrete and Reinforced Concrete begs to report that considerable attention has been given during the past year to the question of the revision of the present adopted Standard Specification for Concrete and Reinforced Concrete. The Committee is not in a position, however, to recommend definite changes at the present time, and it would ask to be continued for another year.

During the past year particular attention has been paid to a most comprehensive set of suggestions forwarded by the Toronto branch. No other definite proposals have been received from members outside the Committee.

It is hoped that some one of the recognized technical societies may adopt a definite specification at an early date, in which case the Committee will have something definite by way of comparison.

Respectfully submitted,

WALTER J. FRANCIS,

Chairman of Committee on Concrete and Reinforced Concrete.

Mr. Francis moved that this report be accepted and the Committee continued, and that the standard specification as published be allowed to stand without change.

COMMITTEE ON GENERAL CLAUSES FOR
SPECIFICATIONS.

This Committee did not present a report and in view of the absence of some of its members, and the inability of others to attend to the work of the Committee, it was resolved on motion by Mr. E. W. Oliver, seconded by Mr. J. R. W. Ambrose, that the Committee be dismissed and that the Council be instructed to appoint another Committee with a different personnel.

The following report on Steam Boiler Specifications was read:—

PROGRESS REPORT OF THE COMMITTEE OF UNIFORM
BOILER SPECIFICATIONS FOR THE DOMINION OF
CANADA.

MEMBERS OF COMMITTEE.

H. A. Bayfield,	R. J. Durley,
W. G. Chace,	D. W. Robb,
F. G. Clark,	H. H. Vaughan,

L. M. Arkley, Chairman.

To the Members of Council, Canadian Society of Civil Engineers,
Montreal.

Owing to the fact that the members of this Committee reside at widely separated points, it is difficult to hold meetings, and most of the work must be done by correspondence.

One meeting was held at Montreal on August 18th, 1916, at which members from Amherst, N.S., St. John, N.B., and Toronto, were present.

After a long discussion as to the best method of accomplishing the object of the Committee, the following resolution was moved by D. W. Robb, seconded by Mr. H. A. Bayfield, and carried: "That the members of the Committee who reside in Toronto namely, Messrs. F. G. Clark, Jas. Laing, J. O. B. Latour, D. M. Medcalf, and H. N. Roberts, and L. M. Arkley, Chairman, form a sub-committee to compare the existing rules for the construction and inspection of steam boilers adopted by Ontario and the other Provinces of Canada, with the Boiler Code of the A.S.M.E.; and to formulate a specification based on those in use in Canada at the present time, with the addition of such specification of materials and other clauses of the A.S.M.E. Code which are considered desirable to supplement the present rules without conflicting with them."

Following along the lines suggested above, the members of the sub-committee are holding meetings in Toronto and are beginning to realize the magnitude of the task ahead of them.

While we have no definite recommendation to make at present, we believe the subject is one of importance, and if granted an extension of time in which to work out the details we should be in a position to make a definite recommendation at next General Meeting.

L. M. ARKLEY,

Chairman, Committee on Uniform Boiler Specifications.

On motion by Mr. E. W. Oliver, seconded by Mr. J. R. W. Ambrose, it was resolved that the report of the Committee be received and the Committee continued.

PORTLAND CEMENT SPECIFICATIONS.

Mr. J. A. Jamieson moved, seconded by Mr. G. A. McCarthy, that "the old Committee be reappointed, or that a new Committee on Portland Cement be appointed." Carried.

GENERAL.

Mr. J. M. Butler made reference to a discussion which took place during the afternoon session on Tuesday, and moved, seconded by Mr. W. F. Tye, "that the minutes and the conduct of the Council is a sacred thing to the Council, that every member must hold inviolate what transpires within the Council." This motion was carried unanimously.

The following letter addressed to the Council of the Society by the Honorary Advisory Council for Scientific and Industrial Research was placed before the Meeting with a request from the Council of the Society for favourable consideration and action.

Ottawa, January 20th, 1917.

DEAR PROF. MCLEOD,

The Advisory Research Council are preparing to secure a confidential inventory of Canada's facilities for scientific and industrial research, in order that they may be able to consider ways and means for effecting:—

- (a) The co-ordination and co-operation of all research agencies.
- (b) The extension and expansion of existing research.
- (c) The mobilization of the scientific man power available for research.

To this end, suitable questionnaires have been prepared to be sent out to the following groups:—

- No. I.—Universities, colleges and technical institutions.
- No. II.—Government Departments (Dominion and Provincial).
- No. III.—Managers and directors of Canadian Industries.
- No. IV.—Members of scientific, professional and technical societies.

Little difficulty is anticipated in securing suitable and prompt replies from Groups I., II. and IV., but there may be some trouble in obtaining satisfactory results from Group III.,—The manufacturers and industries of the Dominion.

The Council are aware that the success of the Industrial Inventory of the United States, taken a few months ago, was very largely due to the fact that the National Engineering Societies of the United States undertook, through their own organizations, to have the forms presented to the manufacturers throughout the country properly filled in and promptly returned to the Director of the Industrial Inventory. The Council, therefore, feel that, if they had the advantage of the assistance of the Canadian Society of Civil Engineers in connection with their questionnaires to manufacturers and industries, satisfactory results would be achieved.

Could the Advisory Research Council obtain the co-operation of the Canadian Society of Civil Engineers in this important matter? If so, it would be of great service to the country and would be very gratefully appreciated.

Yours faithfully,

J. B. CHALLIES, Secretary.

Mr. R. A. Ross explained to the Meeting the special object which the Research Council had in view in connection with this letter.

Mr. J. S. Dennis moved "that the Society cordially endorses the aims of the Honorary Advisory Council for Scientific and Industrial Research, and that our Council be requested to co-operate with them by procuring through its several Branches the details required concerning manufacturers, and to furnish them to the Research Council, and also that our Council be instructed to publish and circulate the report prepared by the sub-committee of our Society on the same lines."

In proposing his motion Mr. Dennis referred to the report prepared by certain members of the Society dealing with subjects allied to the work contemplated by the Government Research Committee. This memorial is addressed to the Prime Minister and signed by Messrs. R. A. Ross, C. H. McLeod, Walter J. Francis, H. R. Safford, in addition to Sir Charles Ross, M.Am.Soc.C.E., with whom the above were associated.

He congratulated the Society on the fact that it had on its Council men who have taken up such a question as this and dealt with it in such a satisfactory and competent manner. He also referred to work now being carried on by the Canadian Pacific Railway relative to the location and extent of our natural resources. Colonel W. P. Anderson seconded the motion proposed by Mr. J. S. Dennis, and it was carried unanimously.

INVITATION TO HOLD THE NEXT ANNUAL MEETING AT CALGARY.

A letter from the Secretary of the Calgary Branch, addressed to the President, Officers and Members of the Canadian Society of Civil Engineers, inviting the Society to hold its next Annual Meeting in Calgary was presented. A telegram from the Mayor of Calgary supporting the invitation was also read.

This invitation was strongly endorsed by Mr. J. S. Dennis and Mr. A. S. Dawson, Chairman of the Calgary Branch.

Moved by Mr. G. A. McCarthy, seconded by Mr. J. R. W. Ambrose, that the Annual Meeting be held in Calgary next year.

It was moved in amendment by Mr. R. F. Uniacke, seconded by Mr. W. Chase Thomson, that the request of the Calgary Branch that the Annual Meeting next year be held in that City be referred to Council with a strong recommendation from this Meeting that if possible it accept the invitation. The amendment being put to the Meeting was carried.

The Secretary then read the report of the scrutineers of the ballot for the election of Officers and Members of Council. As a result of the ballot the President declared the following elected:—

As President.—Mr. J. S. Dennis, Montreal.

As Vice-President.—Mr. J. M. R. Fairbairn, Montreal; Mr. C. N. Monsarrat, Montreal.

As Councillors:—

Mr. R. A. Ross and Mr. Julian C. Smith representing District No. 1.

Mr. H. Longley representing District No. 2.

Mr. A. R. Decary representing District No. 3.

Mr. James White representing District No. 4.

Mr. G. A. McCarthy representing District No. 5.

Mr. W. Pearce representing District No. 6.

Mr. J. H. Kennedy representing District No. 7.

Mr. G. H. Duggan before leaving the chair expressed his hearty appreciation of the co-operation that had been extended to him by the officers and members of Council of the Society, and the officers of Branches and various Committees. He wished to thank them, on behalf of the Society, for the very excellent manner in which they had performed their work during his term of office.

Mr. J. S. Dennis, on taking office, said that he appreciated in the deepest possible manner his election as President of the Can-

adian Society of Civil Engineers, his earnest desire and wish would be that at the close of his term of office he would be able to feel that he had given the Society his best efforts; that during the coming year the combined work of all concerned may result in some achievement of credit to the Society. He expressed the hope that the Society might be known as an organization which is not confining itself only to the consideration of professional subjects, but one which is determined to do everything possible in connection with the solution of the great problems which Canada is faced with to-day.

He said the portraits of our Past Presidents on the walls of this Hall are a reminder of the pioneer work done by the surveyors and engineers of Canada in bringing our country to the position which it occupies to-day.

Mr. Dennis suggested that in the near future an Honour Roll should be placed in this building showing the names of the Members of the Society who have responded to the call of country and honour.

The following votes of thanks were then passed:—

On motion by Mr. P. B. Motley, seconded by Mr. L. G. Papineau, it was resolved that the thanks of the Society are due to the retiring President and Members of Council for the able manner in which the work of the Society had been conducted during the year.

On motion by Mr. Walter J. Francis, seconded by Mr. W. F. Angus, the thanks of the Society were extended to the Montreal Tramways Company for their courtesy in giving free transportation to and from Dominion in connection with the visitation of works.

On motion by Mr. R. F. Uniacke, seconded by Mr. J. A. Jamieson, the thanks of the Society were tendered to the Dominion Bridge Company, the Montreal Ammunition Company and the Dominion Copper Products Company for their courtesy in showing the members of the Society over their works, and for the luncheon subsequently given to the visiting members.

On motion by Mr. J. A. Jamieson, seconded by Mr. E. Brown, the thanks of the Society were tendered to the members of the Reception and Entertainment Committee for their good work in connection with the smoking concert.

On motion by Mr. Walter J. Francis, seconded by Mr. W. F. Tye, it was resolved that greetings should be sent to the members of the Society fighting for us at the Front. Lieut.-Col. C. N. Monsarrat and Mr. J. M. R. Fairbairn were named as a Committee to draft the cable message to be sent to Col. Mitchell, and by him to other members of the Society.

On motion by Col. Monsarrat, seconded by Mr. G. A. McCarthy, it was resolved that the Council is hereby instructed to prepare an Honour Roll to be placed in a prominent place in this building and kept up to date.

On the report of the Gzowski Medal Committee, the medal for the best paper was awarded to Messrs. H. Holgate, Julian C. Smith and R. M. Wilson for their papers on the works of the Cedars Rapids Power and Manufacturing Company.

After the close of the Meeting the Committee reported to Council recommending that a prize be awarded to Mr. C. R. Gibbs for his paper on "Wood Handling and Preparation for Chemical Fibre and Ground Wood Mills."

ELECTION OF MEMBERS OF NOMINATING COMMITTEE.

The Secretary read the following nominations for the election of members of the Nominating Committee for officers and members of Council for 1918:—

On the nomination of the Council of the Society, Mr. H. M. MacKay for District No. 1.

On the nomination of the members of the Council of the Society resident in that district, Mr. J. S. O'Dwyer for District No. 2.

On the nomination of the Quebec Branch, Mr. J. E. Gibault for District No. 3.

On the nomination of the Ottawa Branch, Mr. G. A. Mountain for District No. 4.

On the nomination of the Toronto Branch, Mr. J. R. W. Ambrose for District No. 5.

On the nomination of the Calgary, Edmonton and Regina Branch, Mr. A. S. Dawson for District No. 6.

On the nomination of the Vancouver and Victoria Branches, Mr. H. W. E. Canavan for District No. 7.

These nominations having been put before the Meeting by the President all of the members named were elected.

The Meeting was then adjourned.

DEC 21 1918

The
Canadian Society of Civil Engineers
176 Mansfield Street, Montreal

Established February 24th, 1887.
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REPORT
OF
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